MAY 20, 1961

Chemical Week

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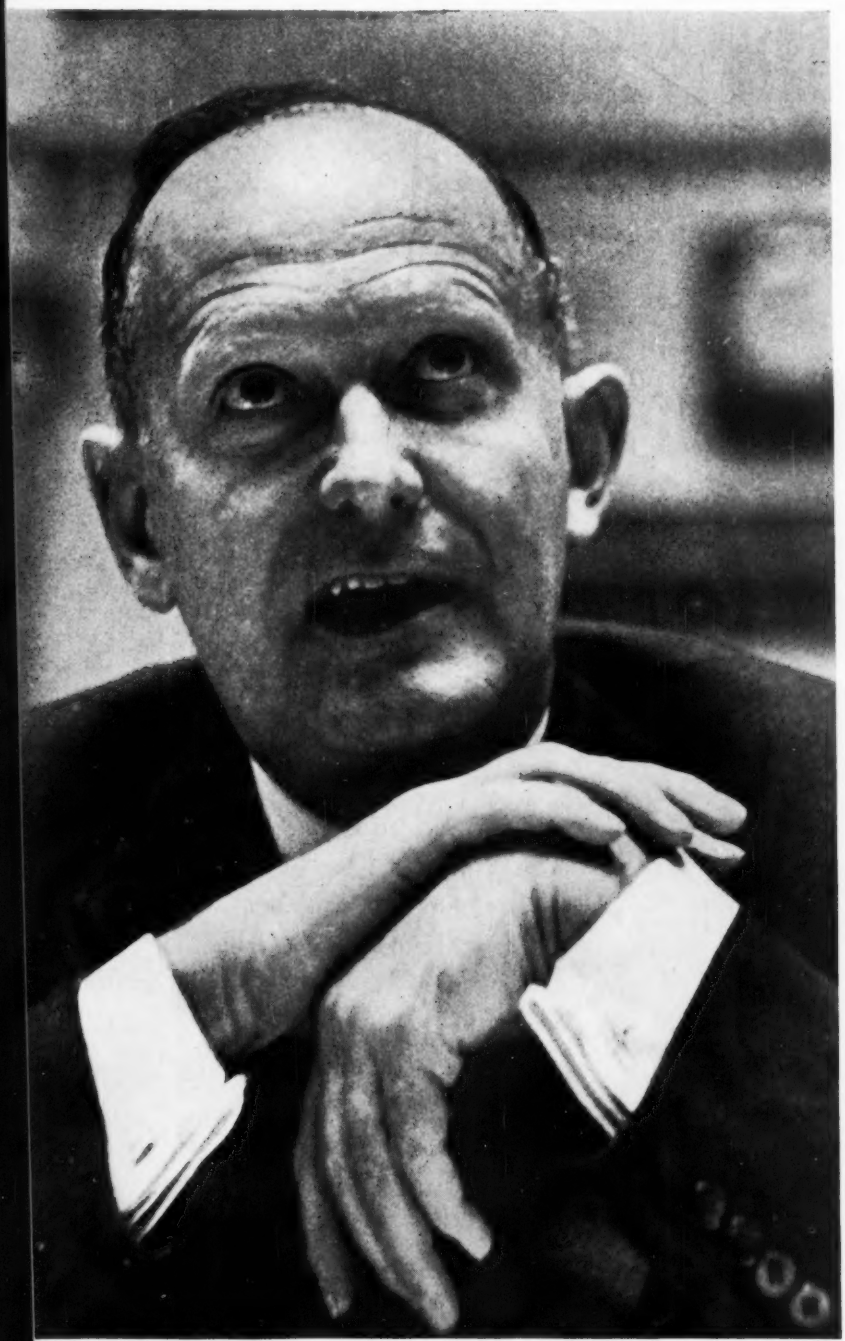

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STEVANS RICE GS CH 3
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WHY ROCK HILL
uses superior quality Mutual Sodium Bichromate

For economy and handling ease, Rock Hill Printing & Finishing Co., a division of M. Lowenstein & Sons, Inc., uses Mutual® Sodium Bichromate as an oxidizing agent in high-style cotton prints like the one shown. Whatever your application, you too can enjoy the excellent handling characteristics of this granular product.

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Allied Chemical

handle sensitive materials safely

■ Creating new materials and using the latest methods to produce them profitably helps the plastics industry set the pace of our industrial growth. One of the most advanced techniques now in use is controlled atmosphere conveying, pioneered by Dracco to provide safe handling of sensitive dry bulk materials.

Controlled atmosphere conveying is a refinement of Dracco techniques for automatic bulk handling, already used by most polyolefin producers. Closed-circuit conveyors carry materials throughout production on a stream of gas whose properties are carefully controlled.

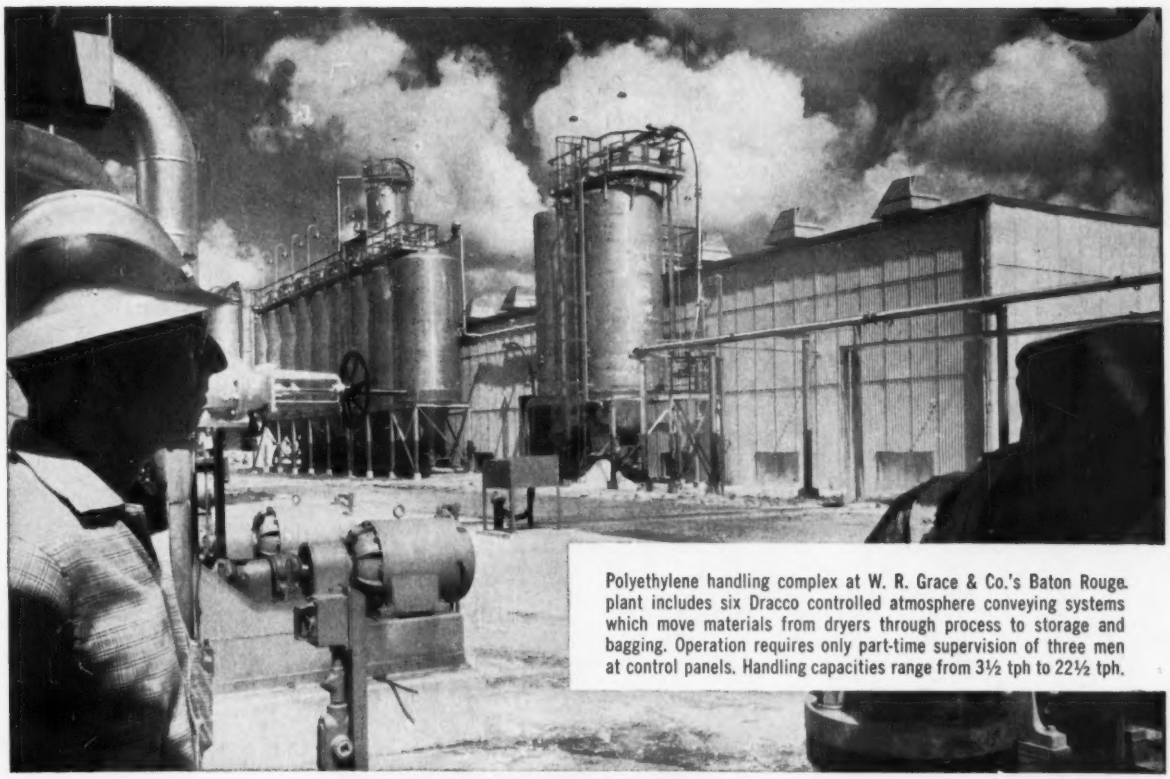
Inert gas or dry, filtered air may be used as the conveying medium where moisture, oxygen or airborne contamination must be eliminated. Temperature may be regulated during handling. Explosion or combustion hazards are prevented.

Systems are fully instrumented and equipped to record pressure and temperature, analyze oxygen content, actuate control devices which avert danger, generate gas, provide cooling, and prevent leakage.

Safe, high-purity bulk flow is just one of the benefits of these systems. They also provide the economies built into all Dracco Airstream Conveyor Systems — minimum labor and low maintenance, plus installation and operational versatility.

For details on how Dracco can insure the special care you need in handling sensitive materials, write Dracco Division of Fuller Co., Harvard Avenue and East 116th Street, Cleveland 5, Ohio.

. . . with Dracco ***controlled atmosphere*** *conveyors*

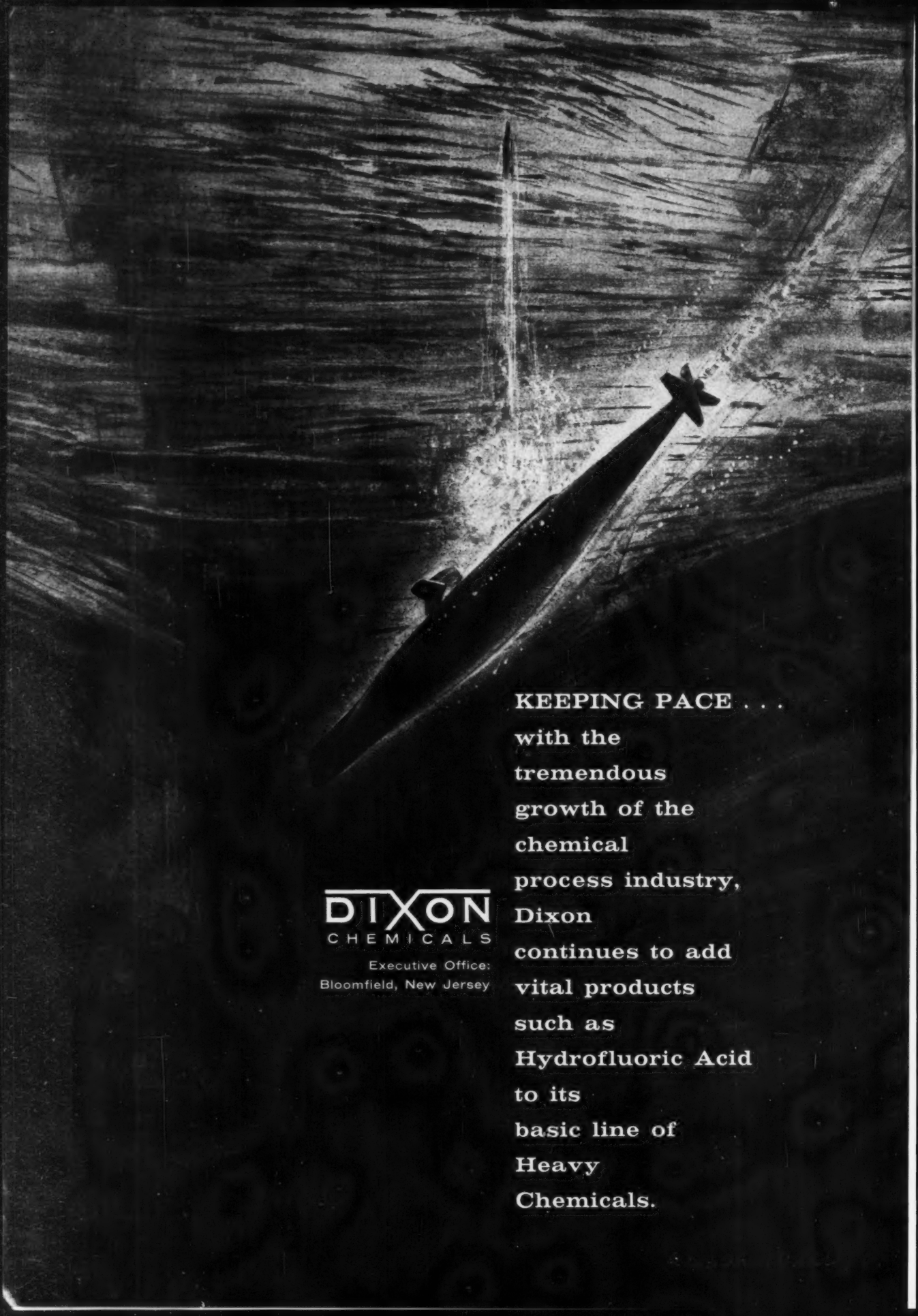


Polyethylene handling complex at W. R. Grace & Co.'s Baton Rouge. plant includes six Dracco controlled atmosphere conveying systems which move materials from dryers through process to storage and bagging. Operation requires only part-time supervision of three men at control panels. Handling capacities range from 3½ tph to 22½ tph.

See Chemical Engineering Catalog for details . . . or write for 32-page Bul. 530, "Dracco Airstream Conveyors".

DRACCO *airstream* conveyors
dust control equipment

FULLER COMPANY GENERAL AMERICA



DIXON
CHEMICALS
Executive Office:
Bloomfield, New Jersey

KEEPING PACE . . . with the tremendous growth of the chemical process industry, Dixon continues to add vital products such as Hydrofluoric Acid to its basic line of Heavy Chemicals.

ON THE COVER: Secy. of the Treasury, Douglas Dillon is target of industry criticism for his plan to bring home the profits U.S. firms make on foreign plants (p. 79).

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VIEWPOINT

An Exasperating Bedfellow

AUTOMATION is an exasperating bedfellow that our economy can't live without, but no one will deny that it's difficult to live with. Especially in these days of high unemployment, it seems unpatriotic—in fact, almost criminal—to displace men with machines.

That's a familiar argument, but it's one that can't stand up to close inspection, of course. Students of our industrial history recognize that automation is simply a continuation, albeit in a more intensive phase, of the industrial revolution that started in the late 1700s—a revolution that has created millions of jobs rather than eliminated them.

But such philosophical speculations are cold comfort to a man who feels his gainful employment threatened, and even colder to the man who has been displaced. Let's face it: although automation creates new jobs for skilled technicians, it renders obsolete the man with marginal skills. What we need is not oratory about our glorious industrial history, but a frank admission of the problem, by both management and labor.

"The tendency of many labor groups embroiled in the threshings of change," Du Pont writes to its stockholders, "has been to cling willy-nilly to the old ways or to superimpose on new developments the costly burdens they were designed to remove. . . . Signs of nonacceptance, as well as of nonunderstanding, are plain. In labor dispute after labor dispute, involving steelmakers, tug-boat operators, airlines, railroads, and numerous others, the approach has been to resist change."

Du Pont could have bragged to its stockholders about the way it handled an automation problem at its Parlin, N.J., photo products plant *(Fortune, Feb. '61, p. 189)*. Fierce competition in photographic film forced the rapid introduction of new machines and the modernization of old processes. New production methods created new jobs and drastically modified old ones; it also eliminated some.

But the changes were not made by fiat. Instead, plant management sat down with the leaders of the bargaining agent, the International Chemical Workers Union, to discuss the problems and exchange views. The situation was especially tough in the X-ray film finishing department; here, over an 18-month period, a quarter of the work force was laid off while output rose 50%. Supervisor Mike Lazo met frequently throughout the entire changeover period with the workers and foremen, and he discussed every proposed change with Joe McCarthy, president of the ICWU local. The changes weren't to everybody's liking, of course, but the workers knew the hard economic facts behind them and felt that their voices had not been unheard. McCarthy summed it up: "You can give them your point of view, and even if they don't say yes all the time, you never have that feeling that you were sandbagged."

Another union that deserves comment is the Amalgamated Lithographers of America. In a recent public service advertisement, Edward Swayduck, president of Local 1, said, "Not only am I for automation, but also I'm convinced that other unions that are not for it are actually and literally underestimating their country. People might be momentarily displaced, but for that brief period the economy would be able to take care of them. Then, as soon as the products were brought down in cost, the general business picture would be enhanced and the various industries would absorb everyone who was displaced."

Enlightened labor and management can do much—through education, cooperation and retraining—to ease the admittedly hard blows of automation; and the result will be more and better—not fewer and worse—jobs for our expanding labor force.

Chemical Week

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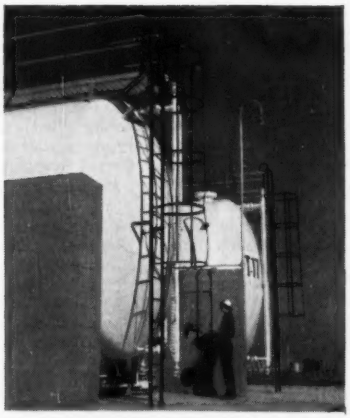
TEXAS ALKYLS INC.

ALKYLS ROUND-UP

Texas Alkyls' New Bulk Facilities Now in Use

The facilities consist of large bulk storage tanks to handle aluminum alkyls, and dilute aluminum alkyl hydrocarbon solutions. The new capacity insures a substantial inventory ready for shipment at all times. These facilities are the largest of their kind in existence and dramatically demonstrate the great strides made in the handling of aluminum alkyls. Two of the new tanks hold 200,000 pounds each; a third holds 25,000 pounds. All are in addition to the original smaller storage facilities.

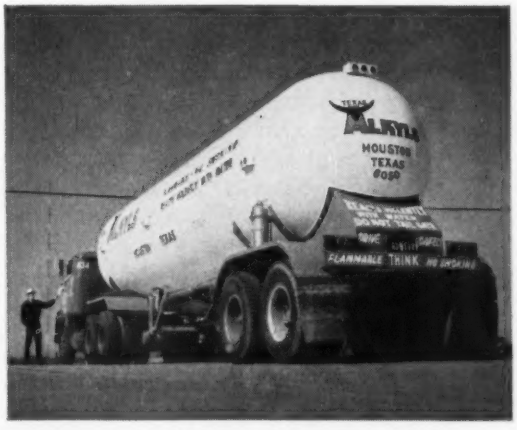


New bulk storage and loading facilities for aluminum alkyls at Texas Alkyls' Houston, Texas, plant.

New loading facilities now in operation provide for loading dilute hydrocarbon solutions of aluminum alkyls in unique new tank truck trailers of 6000 gallons' capacity. Facilities for loading concentrated aluminum alkyls and dilute hydrocarbon solutions in tank cars are under construction.

All dilute hydrocarbon shipments of aluminum alkyls are non-pyrophoric, reducing handling hazards at the customer's plant.

For customers planning to handle and store large volumes of aluminum alkyls, our engineering staff will be happy to assist in the design of customer's facilities. Texas Alkyls' facilities at Houston are open to inspection by customers.



Typical Texas Alkyls' tank truck used in delivery of dilute solutions of aluminum alkyls. The truck has a capacity of 6000 gallons.

Texas Alkyls is continuing to work closely with the I.C.C. and the Bureau of Explosives on developing regulations for handling large bulk shipments of aluminum alkyls. Shipments of dilute hydrocarbon solutions can now be made in tank trucks and tank cars; concentrated shipments can be made in tank cars.

TEXAS ALKYLS ROUND-UP

Safe Handling of Aluminum Alkyls

Aluminum alkyls can be safely handled and used when proper techniques are employed. Because of the rapidly broadening demand for aluminum alkyls there is now a greater need for authoritative information on safe handling. For this reason, Texas Alkyls has prepared a new handling brochure and a film on safety techniques.

The brochure is designed to assist research, pilot-plant, production, design and safety engineers in setting up safe procedures and training personnel to observe and follow them.

The film demonstrates three major facets of interest:

(1) The effect of various extinguishing agents and suggested methods for their use in combatting aluminum alkyl fires.
(2) The effect of aluminum alkyls on various types of protective clothing.
(3) The toxic and dermatologic effect of aluminum alkyls on living tissue.

The new film is of 30-minutes' duration, in color, and available for showing with commentary and explanation by Texas Alkyls representatives. Arrangements can be made to have the film shown at customers' facilities.

Texas Alkyls' engineering and sales-service representatives are available for consultation at customers' facilities on request or by appointment at Texas Alkyls' Houston facilities. Coupon below makes it easy for you to request copies of the brochure on Safety or showing of the safety film.

New Brochure on Basic Reactions and Potential Uses of Aluminum Alkyls

"Organoaluminum Compounds, New Glamor Petrochemicals" is ready for mailing on request.

The new 30-page brochure directs attention to the many potential applications for aluminum alkyls as polyolefin catalysts, pyrophoric igniters for rocket fuels, chemical intermediates for the manufacture of straight-chain alcohols and alpha olefins, a source of aluminum for gas plating and as strong reducing agents for pharmaceutical and chemical applications. Now that aluminum alkyls are available in commercial quantities at attractive prices from Texas Alkyls, industry is actively exploring new uses for these reactive and versatile chemicals.

The new brochure features a compilation of reaction data, uses and an extensive bibliography of 90 references—to recent literature on organoaluminum compounds. Copies of the brochure are available on request by coupon below or on company letterhead.

11 New Aluminum Alkyls Added by Texas Alkyls

To triethylaluminum, triisobutylaluminum, ethylaluminum sesquichloride, diethylaluminum chloride, diisobutylaluminum hydride and aluminum isoprenyl previously announced and available in commercial quantities, Texas Alkyls announces the following aluminum alkyls are now available in development quantities from inventory.

Diisobutylaluminum chloride	Triisopropylaluminum
Monoisobutylaluminum dichloride	Tri-n-butylaluminum
Ethylaluminum dichloride	Tri-n-hexylaluminum
Methylaluminum sesquichloride	Triisohexylaluminum
Tri-n-propylaluminum	Tri-n-octylaluminum

Tri-n-decylaluminum

In addition to the products noted, other aluminum alkyls can be prepared to customer specifications. A new pilot plant, in operation for the past six months, has the flexibility to meet customer requirements quickly.

TEXAS ALKYLS, INC. • STAUFFER CHEMICAL COMPANY
ANDERSON CHEMICAL DIVISION • EXCLUSIVE SALES AGENT
WESTON, MICHIGAN

Please send me:

- ☐ Brochure: "Organoaluminum Products: Glamor Petrochemicals"
- ☐ Brochure: "Safety and Handling: Aluminum Alkyls"
- ☐ Safety Film: We are interested in a showing about _____ (date)
- ☐ Technical Data on _____ (Type of Aluminum Alkyl)

for _____ (application)

(Name) _____ (Title)

(Company) _____

(Street) _____

(City) _____ (Zone) _____ (State)

LETTERS

Leased Anodes

TO THE EDITOR: . . . Chlorine producers are able to enjoy the benefits of platinum-coated anodes without capital investment. Von Bree, Inc., has developed suitable leasing arrangements so that the anodes may be rented or leased by a chlorine-cell operator rather than purchased as a capital item.

DONALD B. BURKHARDT
President
Von Bree, Inc.
Brookside, Newark, Del.

Maintaining Our Ideals

TO THE EDITOR: Re: "Are Our Ideals Realistic?" (*April 8, p. 5*). . . .

I have read your editorial three times, but if you offer a solution of this most important problem I fail to find it. Still I want to thank you for pointing your finger at it, and making an honest attempt to contribute to a solution.

I am personally alarmed, not because of the offense of the convicted executives, nor because of their conviction, but because the overwhelming reaction of the people I talked to was to shrug it off. Yet anybody who reads history will realize that invariably nations and civilizations have fallen not to the enemy from the outside but to the gnawing decay of morals and principles on the inside. . . .

I wonder whether you would not have come closer to tangible proposals if you had reworded your editorial: "Can we make our ideals realistic?" I feel that the vast majority of your readers agree on the basic soundness of our political and economic system, but we all have been brainwashed in fearing attack only from those who advocate a communistic system, and in disregarding the much greater dangers stemming from inertia, disregard, excess and abuse by those who mouth pious platitudes and measure status solely by bank account.

The Bill of Rights and free enterprise are still the best, and maybe the only, system fit for free men. . . . At our own desks, in sales offices and in purchasing offices, in corporations and in government bureaus we must remain aware that vigilance is the price of liberty. . . .

What we must do . . . is adapt our practices again to our ideals, and not our ideals to our practices.

What we must do is learn again that competition is the lifeblood, the *sine qua non* of all free enterprise, and that any restraint of competition, by labor, management or government is potentially dangerous to free enterprise, and must be opposed by all who wish to remain free men in a free society. . . .

WILLIAM H. SACHS
Consultant
Atlanta, Ga.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: H. C. E. Johnson, Chemical Week, 330 W. 42nd St., New York 36, N.Y.

MEETINGS

Engineering Institutes, industrial engineers seminars, "Effective I.E. Department Management," May 23-24; "Plastic Films," May 25-26, University of Wisconsin, Madison, Wis.

Sea Horse Institute, 1961 meeting, Crest Theatre, Wrightsville Beach, N.C., May 23-26.

International Water Supply Assn., fifth congress, Congress Hall, West Berlin, Germany, May 23-June 1.

Commercial Chemical Development Assn., spring meeting, Bedford Springs Hotel, Bedford, Pa., May 24-25.

Western Petroleum Refiners Assn., computer conference, The Benjamin Franklin Hotel, Philadelphia, May 24-26.

Pacific Northwest Society for Paint Technology, annual symposium, Georgia Hotel, Vancouver, B.C., Can., May 26-27.

American Institute of Chemical Engineers, sixth technical conference, McNeese State College, Lake Charles, La., June 1.

Society of the Plastics Industry, Inc., national plastics conference, New York Coliseum, New York, June 5-9.

National Congress on Environmental Health, University of Michigan School of Public Health, Ann Arbor, June 6-8.

Manufacturing Chemists' Assn., annual meeting, Greenbrier, White Sulphur Springs, W. Va., June 8-10.

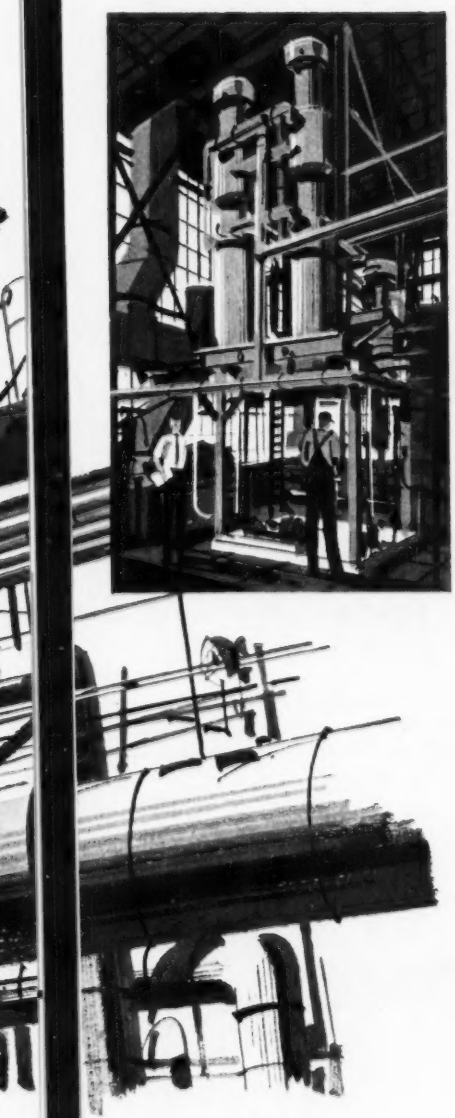
can be costly! On conveyors, a new type of lubricant developed by Cowles helps bottlers beat breakage. It is new ideas like this that produce an ever-widening market for Cowles organic and inorganic processing chemicals. For new things in chemical know-how, keep your eye on Cowles.

NEW PRODUCTS
NEW FACILITIES
NEW THINKING

Cowles

COWLES CHEMICAL COMPANY
Cleveland 20, Ohio

Foster Wheeler *Heat Engineered* products, plants and processes...for the world's industrial progress.



Scale-up the profit in your process

How can a processor scale-up a new process from pilot plant to large commercial installation and bring it to profitable operation without a long and costly start-up period?

The Foster Wheeler method is thoroughness. FW avoids or minimizes major stumbling blocks by careful attention to detail . . . by thoroughness firmly supported by careful organization and solid experience.

Examples are: the scale-up of a urea plant from 3 to 260 tons per day; a new FW deasphalting process from 1 to 10,000 barrels a day and a 300 ton per day ammonia plant that exceeded rated capacity 30 days after erection.

Whether for a proven process or scale-up project, FW gives you the thoroughness and experience you need—in design, engineering and construction—to build your process plant . . . any capacity . . . any process . . . anywhere in the world. Foster Wheeler Corporation, 666 Fifth Avenue, New York 19, N.Y.

FOSTER FW WHEELER

NEW YORK TORONTO LONDON PARIS MILAN TOKYO

This titanium coil has eliminated downtime due to corrosion and erosion. Result...

In hypochlorites...

Lifetime Titanium heat exchanger pays for itself with trouble-free performance at Pennsalt

Titanium's ability to withstand hot chlorine environment, its noncontaminating and antifouling characteristics have put a stop to costly trouble before it started in Pennsalt's calcium hypochlorite process.

Two titanium heat exchanger coils are located in the heart of the operation:

Chlorinator. Chilled water pumped through the titanium coil carries off heat evolved when lime slurry is chlorinated. Coil has been completely trouble-free, despite *hot*, wet chlorine environment. No need for repairs. And the chemical buildup on the coil is easily washed off with water.

Pennsalt engineers say that the titanium coil, placed in service in 1959, still shows no sign of corrosion nor erosion. Because of this, the unit has at least paid for itself from reduced downtime.

Crystallizer tank. Still in place after three trouble-free years, the titanium coil has far outperformed a vinyl-coated stainless steel coil that lasted for only one year.

Titanium costs are dropping. For example... the latter titanium coil originally cost $6,200. As an experiment, Pennsalt engineers had the unit re-estimated recently. They found that they could purchase a new coil—including an additional $850-worth of spacers—for a total of $4,204!

Lesson to be learned: Selection of the *right* titanium fabricator (TMCA can help you with this) is a sure-fire way of controlling your costs. Also, basic metal prices are improving. In the past three years they have been reduced by 50%.

If you are faced with maintenance problems in equipment operating in wet chlorine... or hypochlorites... or urea ... or inhibited sulfuric acid, contact TMCA. Our chemical experience is at your disposal.

Get the facts:
Performance data... fabrication.
Write Today.

TIMET®

TITANIUM METALS CORPORATION OF AMERICA

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NEW...

FLEXICHEM CS-FOOD GRADE*

(Calcium Stearate)

GENERAL PROPERTIES

Type of salt:	Di
Physical form:	Impalpable powder
Particle size:	Average 5-7 microns
Color:	White
Odor:	Bland
Bulk density:	20 lbs. per cu. ft.
Melting point:	147°-149° C. (determined by gradient bar)
Moisture:	0.6%
Iodine number:	2 maximum
Arsenic:	Less than 0.2 ppm.
Total Heavy Metals:	None detected
Solubility:	Insoluble in water, alcohols, esters and ketones. Slightly soluble in hot benzene, toluene, xylene, carbon tetrachloride, vegetable and mineral oils. Soluble in hot pyridine.

For further details, write for Bulletin No. 55

* the fatty acids used in the manufacture of this product are derived from food grade edible tallow and have passed the Chick Edema test

Flexichem CS—Food Grade—Calcium Stearate is a product of Swift & Company research. It provides all the advantages of a high quality calcium stearate in a food grade product. Flexichem CS Food Grade can be used as a conditioning agent in certain food and pharmaceutical products. It will also help solve problems in the processing of food packaging materials such as paper, plastics or rubber.

If the general properties listed above suggest possible uses in your operations, write for details on trial or sample quantities of Flexichem CS Food Grade.

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INDUSTRIAL CHEMICALS
106TH YEAR

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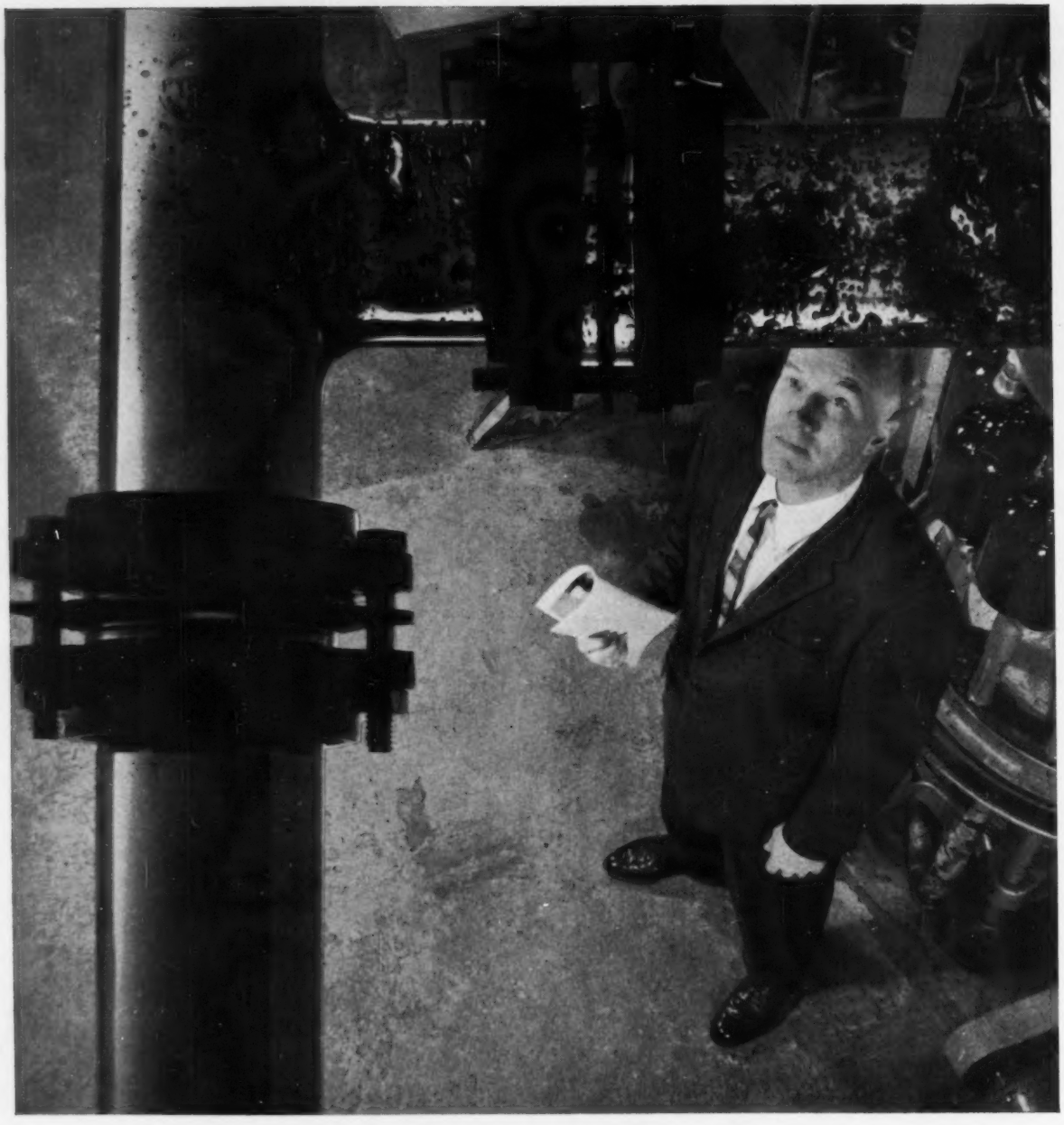

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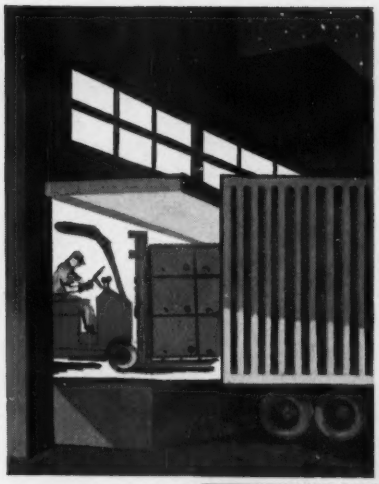

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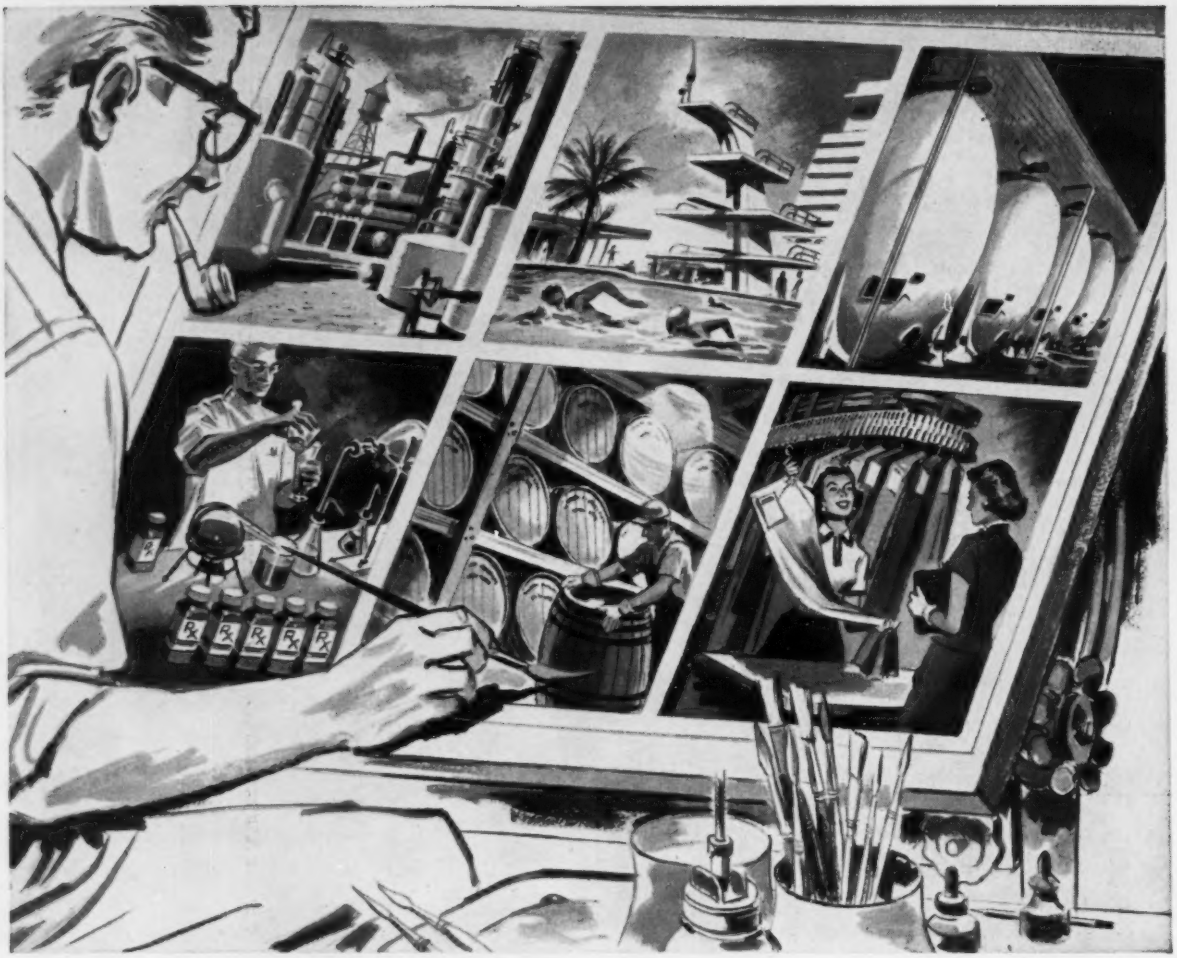

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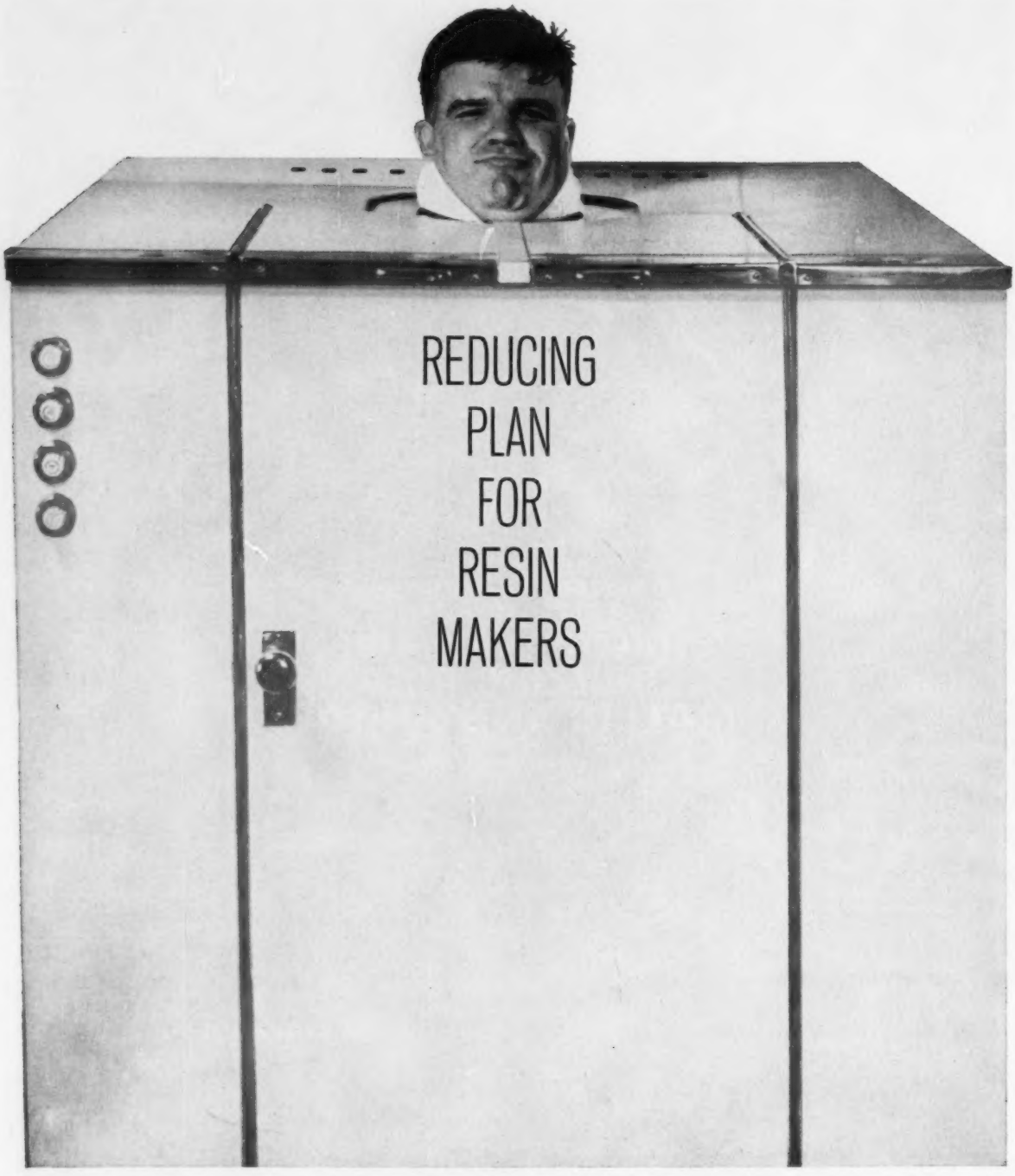

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Business
Newsletter

CHEMICAL WEEK
May 20, 1961

Worldwide aluminum industry prospects continue to brighten. That's the only conclusion that can be derived from new activity of present producers to increase production, and from reports of new potential producers.

Thus far in the U. S., the industry's operating rate is well above 80% (*CW, May 13, p. 25*). It will go higher. By early next month, for instance, Kaiser Aluminum & Chemical will have restarted five potlines at three of its plants (Ravenswood, W. Va., Mead, Wash., and Chalmette, La.), which were pulled out of production when aluminum sales began tumbling.

Restarting of two additional lines at the Chalmette Works (one this week, the other about June 1), means that eight of that plant's nine units will be in operation. Each potline can turn out 27,500 tons/year of primary aluminum.

A new, $25-million aluminum reduction plant for the Pacific Northwest may be in the works. Howe Sound Co. (New York) is reportedly negotiating with Port of Portland (Oregon) officials for a site at the confluence of the Willamette and Columbia Rivers. (The Portland Commission has approved an offer for a 230-acre site at $2,000/acre.)

There are no details on how big the Howe Sound aluminum venture might be, but a $25-million expenditure could mean a two-potline plant able to turn out 40-50,000 tons/year of primary aluminum.

The company's Portland project (if it goes through) may also include an electrolytic manganese ore plant.

•

Morgantown Ordnance Works deal falls through. Late last week the General Services Administration and Deuterium Corp. failed to agree on payment terms of the company's final (and accepted) bid of $3.75 million for the surplus plant that has been on the block for some time (*CW Business Newsletter, Feb. 25*).

Deuterium President Jerome Spevack had set a Friday noon deadline on the offer, said he had no authority to continue negotiations beyond that date. The company had previously made two other bids for the works, which GSA had turned down.

The government agency has revealed that another firm is actively interested in buying the property. The new bidder was not identified.

•

A new methyl chloride venture on the Gulf Coast may be near. Trade speculation has been rife that Ansul Chemical (Marinette, Wis.) has been considering a 60-million-lbs./year plant for the Lake Charles, La., area, but so far there's no official word from the company.

Interest in methyl chloride stems from the hectic activity now going on in TEL and TML (*CW, Feb. 4, p. 21*); it's a basic raw material for the gasoline additives. Two new TEL/TML entrants—Nalco Chemical (at Freeport, Tex.), and Houston Chemical (Beaumont, Tex.) are prime sales prospects for Ansul's methyl chloride.

•

Plans are set for two new chlorine-caustic additions to the North American scene:

In the U.S., General Aniline & Film's Antara Division will boost its 50-tons/day chlorine-caustic capacity at Linden, N. J., to a hefty 230 tons/day. Construction on the "multimillion-dollar" project will begin soon, be completed in early '63.

And in Canada, work has already begun on a new Dryden Chemicals Ltd. plant at Dryden, Ont., which will produce chlorine, caustic soda and sodium chlorate for the bleached pulp trade. A "turnkey" contract (design, engineering, construction) has been awarded to Vickers Krebs Ltd. (Montreal).

•

Canadian benzene capacity is up 6 million gal./year via British American Oil's new, $2.5-million aromatics extraction plant at Montreal. The benzene is used for cumene, which is converted into phenol and acetone at a nearby B.A.-Shawinigan petrochemicals plant.

•

U. S. Chemical investments aren't being stymied, despite apprehensions over Administration proposals to boost taxes on foreign income (*see p. 79*).

Diamond Alkali, with Ibis-International Investment (Panama), has purchased a half interest in Sipes do Brasil from the Medicinalis group. Sipes has been reorganized as Carbocloro-Industrias Quimicas Ltda. Some $4 million will be added to capital to modernize and enlarge Carbocloro's Sao Caetano plant and to build a new plant at Cubatao. (The Cubatao plant will make 200 tons/day of chlorine; 220 tons/day of caustic, hydrochloric acid; and bicalcium phosphates.)

Hercules Powder, through its Canadian subsidiary, will build a naval stores plant in British Honduras. The new project will be in partnership with a British firm, to process pine stumps and logs for naval stores extract that will be shipped to the U. S. for refining.

Merck has acquired Cipelli Industria Farmaceutica (Pavia, Italy). The Italian acquisition will serve as a nucleus for operations in the Mediterranean and Near East area. Cipelli's present line of plant-based ethical preparations, chemical biological, and chemical specialties, will be expanded to produce Merck specialties such as corticosteroids, diuretics, antihypertensives, and antihistaminics.

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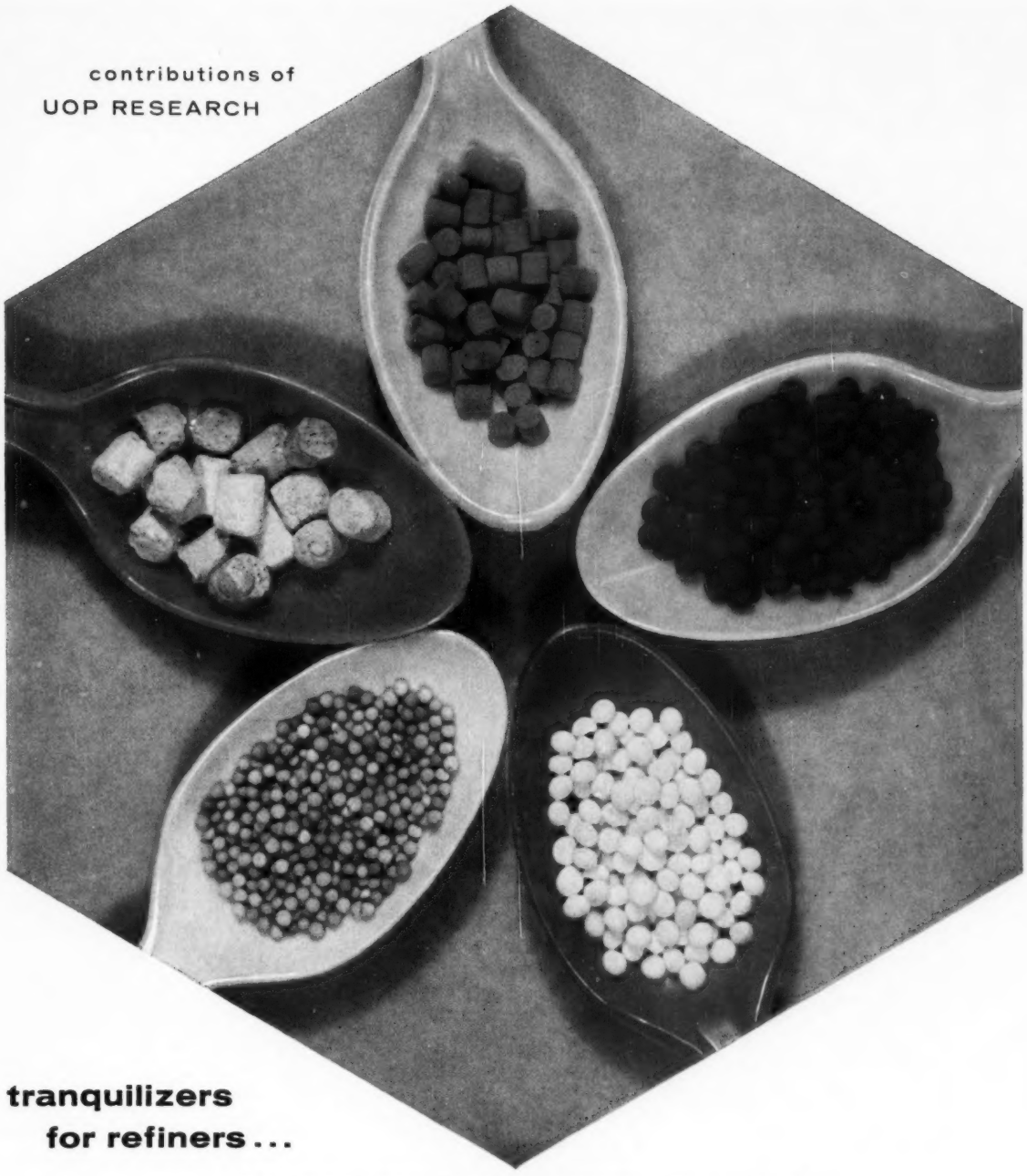

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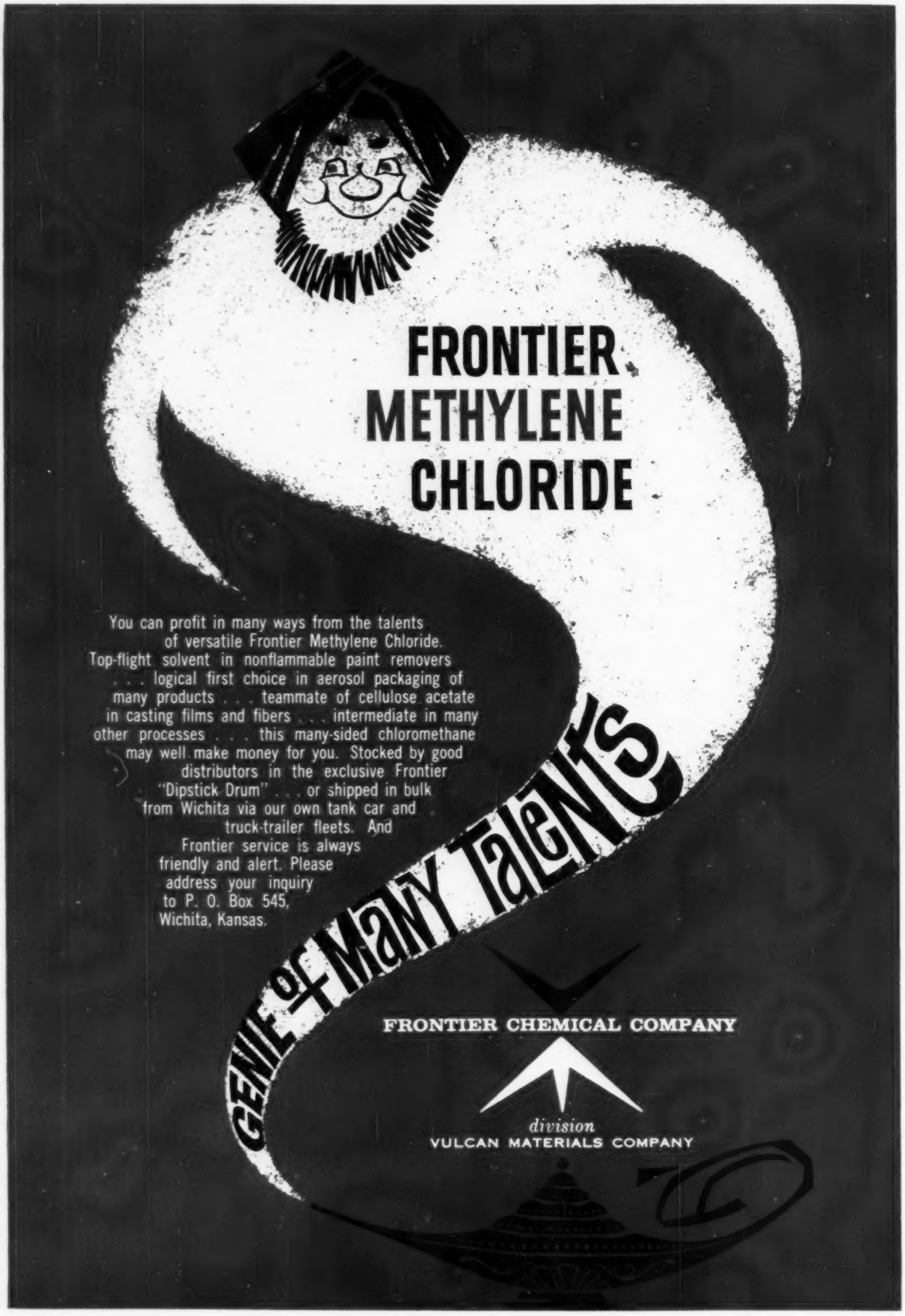
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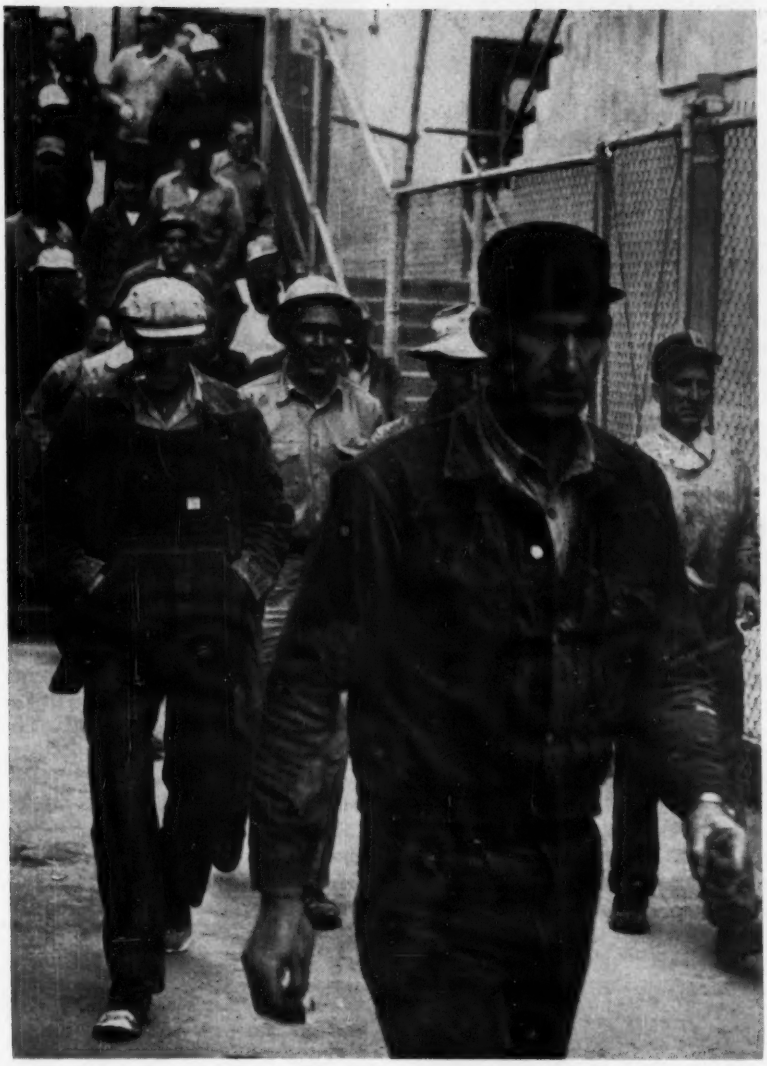


Chemical industry work force: Slated to increase only in quality.

Wanted: Only the Best

Chemical firms laid off few during recession, now seek few new staffers

Chemical companies will put extra stress on quality and de-emphasize quantity in their employment activities from now through September.

New hiring will be at a low rate and total work forces will increase only moderately, if at all, during the rest of '61, even if business continues to improve. Recruiting efforts on college campuses are noticeably less omnivorous than in previous years, and somewhat fewer students than usual will be hired next month for summer jobs.

Nevertheless, a CHEMICAL WEEK survey of leading personnel executives also reveals that U.S. chemical companies are avidly in the market for certain highly qualified specialists. Those in greatest demand now and for the foreseeable future:

- Chemists with Ph.D. degrees.
- Chemical engineers of above-average capability.
- Salesmen with technical training and of proved ability.

More 'Chiefs': For the chemical industry as a whole, it's clear that there's a strong trend toward more "chiefs" and fewer "Indians."

From April '60—when business as a whole was booming—total employment in chemicals and allied products dropped slightly—from 882,300 to a recession low point of 869,700 in Jan. '61—and then climbed back up to 881,800 last month. Thus total net change over the past 12 months was less than 0.1%.

But closer inspection shows that this small over-all change is the net result of two much larger changes that—so far as their effects on total chemical employment are concerned—nearly cancel each other out. One is that from April '60 to April '61, number of hourly paid production and maintenance workers in the industry dropped by 10,600; the other is that in that same period, the number of salaried employees increased by 10,100. In one respect this trend was much more pronounced in the chemical industry than in most other industries. With less than 6% of the total employment in U.S. manufacturing, the chemical industry accounted for just 1.2% of the 921,000 fall-off in hourly paid workers during the April-to-April period; but it accounted for 59.4% of the 17,000 increase in salaried employees.

Personnel directors indicate that efforts to upgrade their work forces will be taking place at all levels. Several companies say that continuing advances in mechanization and automation will call for increasing numbers of skilled maintenance and production workers, most of whom will come from in-company training programs. Only one of the larger companies expects to need significantly more clerical employees.

The big demand is for competent technical personnel; and this is keeping recruiters busy. Even though total hiring is at a low clip, one executive explained, "there is such stiff competition for really good men—especially top-notch chemical engineers—that the intensity of recruiting programs hasn't decreased."

Rayonier's Erickson: Sales to rise first, profits to improve next year.

Prying Up Profits

New products, a raft of plant improvement and expansion projects, and the economic recovery are making it an odds-on bet that Rayonier (New York) will rack up record sales (particularly in physical volume) this year. But profits, it appears this week, are likely to lag again in '61 before taking a turn for the better in '62.

Appearing before New York security analysts last week, Rayonier President Russell F. Erickson cited two reasons for expecting an improvement in earnings (which last year sagged 29.1%, to $9.5 million): (1) likelihood of making "needed price adjustments," (2) completion of the firm's major construction projects later this year.

From Sulfite to Sulfate: A new sulfate paper pulp mill, going up on the site of a previous sulfite mill at Woodfibre, B.C., will start next month. Much of the wood chip raw material will come from Rayonier's own sawmills. At Grays Harbor, Wash., Rayonier is building a new pulping chemicals recovery unit and Rayonier and Hammermill Paper are adding a second paper machine to their jointly owned mill.

The mill at Jesup, Ga., is being altered to turn out certain new special-use pulps; and the silvichemical plant at Vancouver, B.C., is being modified for production of new chemical intermediates for adhesives and agricultural chemicals. Major changes underway in the mill at Fernandina Beach, Fla., are to broaden the product line by expanding the plant's range of pulping processes.

New products include an improved chemical cellulose for rayon tire yarn, new pulps for use in cellulose acetate textiles and plastics, two new papermaking pulps, and silvichemicals for use in waterproof industrial adhesives and in oil-well drilling muds.

Market Gains: Erickson predicts that two-ply tires will soon be original equipment on new cars, a move that will benefit makers of rayon tire cord. Cellophane demand in the U.S. climbed from 375 million lbs. in '55 to 439 million lbs. in '60, and is predicted to exceed 500 million lbs. by '65.

Rayon and acetate have not been gaining in the U.S. market, Erickson concedes; but he points out that world demand for cellulosic fibers has been hitting new peaks regularly for the past 10 years. He maintains that "continued growth is assured as the purchasing power of underdeveloped countries rises." And markets for acetate film have been growing.

Breakdown of Rayonier's '60 sales of $129 million: chemical cellulose, 64.2%; lumber and shingles, 14.8%; papermaking pulps, 12.1%; fine paper, 7.3%; silvichemicals, 1.6%. Profitability was highest on silvichemicals; there was a small net loss on lumber and shingles.

Meanwhile, profits are being squeezed, with selling prices down on all major product lines—frequently to less than '50 levels—while operating costs have risen. Depreciation charges will increase from last year's $10.55 million; and with a half-dozen plant projects to be completed this year, startup expenses also can be expected to mount. This year's capital expenditures—which probably will increase 52%, to $29 million — again will come from internal sources.

But by year-end, Erickson figures, the new projects — aimed at boosting pulping capacity to 875,000 tons/-year and increasing the main plants' efficiency and versatility—will be paying off. And if the firm wins markets for its array of new products—e.g., hydroxyethyl cellulose (*CW, April 22, p. 35*)—Rayonier's earnings could be well on the way toward matching the '55 peak of $15.9 million.

White, Weld's Neidig: Investors are losing enthusiasm for chemical shares.

Cooling on Chemicals

Dwindling investors' interest in chemical stocks is the subject of C. P. Neidig's speech accepting the '61 Chemical Market Research Assn. Memorial Award at the organization's convention in New York this week.

Reason: chemical stocks have lost much of the attractive earnings/price ratio they had between '50 and '55. In '50 Standard & Poor's 425 industrials had an average price 6.4 times earnings; the five major chemical companies had a ratio of about 11.5. In '55 the S&P industrials were 11.6, the five chemicals were 22. In '60 the S&P industrials were 17.5, the chemicals about 23. During the past five years, the earnings/price ratio has not moved up much and has become closer to that of stocks in general. At the same time, although the five companies invested about $3 billion, actual pretax earnings were less in '60 than in '55.

Neidig, a general partner in the Philadelphia investment firm of White, Weld & Co., says that loss of the compound advantage they had during the first five years of the '50s—when the ratio and level of earnings both improved—has led to a conspicuous lessening of investor enthusiasm for chemical stocks. Case in point: chemical shares no longer loom as large in major funds.

Vying for Smog Sales

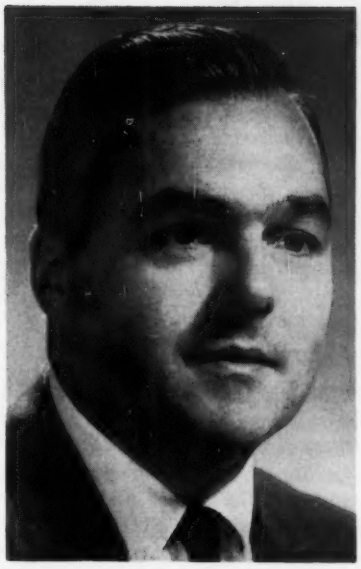
The California Motor Vehicle Pollution Control Board is getting two new entries in the contest for slices of the auto-exhaust-cleanup market: W. R. Grace and American Cyanamid are nominating new oxidizing catalysts for the job. The board meets this week to decide on specifications for smog-control devices for all 6.6 million of the autos, trucks and buses in that state.

Grace's Davison Chemical Division, working with Norris-Thermador Corp. (Los Angeles), has submitted its product to the board for testing. This brings the number of entries to nine. Cyanamid expects to have its product before the board within the next few weeks.

Actually 16 products have been submitted, but the board has already turned thumbs down on seven. Now in the running are five catalytic systems, three direct-flame or afterburner devices, and one induction system. Submitting these entries: catalysts—Grace, Oxidation Processes (subsidiary of Universal Oil Products), Arvin Industries (Columbus, Ind.), Wolverine Tube Division of Calumet & Hecla (Chicago), and Oxycatalyst Co. (Wayne, Pa.); afterburners—Morris-Williams Venture (Oakland, Calif.), McAlester Aircraft (Los Angeles), and Chromalloy Corp. (New York); and induction system—Standard Products (Cleveland).

To win the board's approval, a device must be able to reduce exhaust hydrocarbons to no more than 275 parts per million, bring carbon monoxide down to 1.5% by volume. Qualifying candidates will be submitted to 20,000-mile use tests on cooperating taxi and truck fleets. When at least two devices have been approved, every new car in the state will be required to have one within one year. Owners of older cars will get three years to comply.

Other criteria being taken into consideration include price, durability, safety, odor, noise and excessive heat. To cover both the catalysts (which are cheaper but generally are designed to last about 25,000 miles) and the afterburners (which cost more, last from 50,000 miles up to the lifetime of the car), the board is thinking of setting a maximum cost of 0.5¢ per mile of expected service.



Collier's Kaesche: Taking over a company that's in a hurry to grow.

Pushing Collier's Growth Plan

Collier Carbon and Chemical (Los Angeles)—a company in a hurry—is planning to become basic in phosphates, go into production of methylnaphthalene and other petrochemicals, and further upgrade its chemical products to achieve what the company calls "upward integration."

Founder and chairman, Robert T. Collier says the company has practically completed its prospecting preparatory to obtaining "a basic position in phosphate reserves to provide low-cost rock for our increasing production of phosphate fertilizers." Collier (an 80%-owned subsidiary of Union Oil Co.) has recently built a phosphoric acid plant at Kellogg, Ida., and acquired 60% interest in Western States Chemical Corp., a southern California company that produces a line of ammonium phosphate fertilizers.

The prospecting, Collier tells *CW*, has been carried out in both the Western and Southeastern phosphate rock areas, and has included some offshore exploring. And the company has been working on plans to develop other mineral resources, he adds.

Collier—who was succeeded as president of the company last month by William C. Kaesche, previously executive vice-president (*CW, April 8, p. 24*)—points out that the parent company's large reserves of natural gas and liquid hydrocarbons in Louisiana and Alaska "provide many possibilities" for petrochemical expansion. "We are pushing ahead on projects utilizing the advantages of those areas," he adds.

Collier says his concern is moving toward manufacture of methylnaphthalenes and related aromatic chemicals, for use in making synthetic fibers, insecticides, plastics and rocket fuels. A 100-million-lbs./year petroleum naphthalene plant is due on-stream in November at Delaware City, Del., and construction of a similar plant at Los Angeles is slated to begin in July. Both are joint ventures of Collier and Tidewater Oil.

Size of the naphthalene plant to be built adjacent to Union Oil's Los Angeles refinery apparently hasn't yet been decided. This reportedly will depend largely on outcome of negotiations now under way with five major producers of phthalic anhydride in Japan. If at least the three largest of those companies agree to purchase quantities of Collier naphthalene in a package deal, the Los Angeles plant will be a virtually exact copy of the Delaware City plant; but if the Japanese deal falls through, the Los Angeles plant would be only half that large.

Also, Collier is understood to be negotiating on a proposal to sell the Los Angeles plant's naphthalene to Allied Chemical, which has been considering construction of a 25-million-lbs./year phthalic anhydride plant near Los Angeles (*CW, Dec. 10, '60, p. 87*). Recently some observers have seen indications that Allied is becoming less enthusiastic about that project, even though it has a captive outlet—Specialty Resins Co. (Lynwood, Calif.), —for phthalic in the Los Angeles vicinity. Allied acquired that firm's resins and plasticizers business and plant last August.

Collier says the recent acquisition of Pacific Guano (with its 60% interest in Western States) is the biggest single factor in the firm's increased sales and capital spending this year. Capital outlays are expected to climb 83%, to $11 million; '61 sales are likely to be up more than 50%, to some $37 million. The '60 sales mix: industrial chemicals, 15%; carbons, 27%; farm chemicals, 58%.

Bucking the Profit Trend

Late-reporting CPI companies fared somewhat better during '61's first quarter than most of the firms that tallied their operating results earlier (CW, May 6, p. 40).

One of the best showings was made by W. R. Grace & Co., especially its chemical divisions. President J. Peter Grace, in the first quarterly report issued by his company, pointed out that "chemical profits continued to show substantial growth" and represented the greatest part of the 28.6% increase, to $3.6 million, in total operating earnings. Chemical sales, he added, rose more than 20%, primarily because of higher sales of agricultural chemicals and increased sales to the packaging industry both in the U.S. and overseas. Polymer Division operations were in the black, with sales up more than 100% from first-quarter '60.

Universal Oil Products—another company that has been diversifying into chemicals—also reported that first-quarter earnings were up sharply. Chairman Maynard P. Venema told stockholders that net income more than doubled, to $474,000; and that "further diversification through new acquisitions is being explored."

Modest Gain for 3M: Minnesota Mining and Manufacturing Co. managed to nudge earnings upward 1.7%, to $16.5 million; but it took an 8.6% increase in sales, to $139.7 million, to achieve that modest gain. A similar experience on a smaller scale is reported by Chemical Process Co.: sales up 4%, to $1.6 million; earnings up 1%, to $87,400.

For American Metal Climax, first-quarter earnings were $7.5 million, 21% less than in first-quarter '60; but Chairman Walter Hochschild told stockholders that earnings were "at a satisfactory level," considering that the higher profits of the year-ago period reflected unusually strong demand for molybdenum both in the U.S. and abroad. As sales were off 28%, to $136.3 million, there was actually an improvement in the company's profit margin. Hochschild said Amax expects to operate its molybdenum and potash plants at full capacity throughout this year.

Several companies achieved gains in gross profit that were wiped out by nonrecurring expenditures. U.S. Borax & Chemical says its six-month sales inched up 0.7%, to $32.8 million, and gross profit improved by a larger percentage, but that net income dipped 17.2%, to $2.7 million, because of increased outlays for advertising. President Hugo Riemer put the cost of additional advertising expenditures for consumer products at 21¢/share, compared with the reduction in net income of 13¢/share.

Sulfur Shift: Jefferson Lake Sulphur went from an $86,121 profit in first-quarter '60 to an $18,067 net loss for the corresponding period this year; but the trend would have been upward if it hadn't been for nonrecurring "shutdown expenses" on three facilities. President Eugene H. Walet, Jr., predicts that earnings for the full year will show an increase over '60. He says that first-quarter sulfur shipments from the company's Gulf Coast mines dropped 31%, but that shipments of the Canadian subsidiary shot up 63%.

Carwin's main plant at North Haven, Conn., hoisted its first-quarter operating profit by 46.2%, to $65,275; but startup expenses and depreciation on its new plant at Houston, Tex., resulted in a $108,125 net loss for the period. President Carl VanWinckel looks for the Houston plant to reach its break-even point in the next few months and a gradual improvement in the company's over-all profitability through the remainder of '61.

Two Chicago-based companies held their own during the period. Stepan Chemical's operating profit "remained virtually unchanged despite the reduction in volume"; President Alfred C. Stepan attributes this to "marked operational economies that did not come into full play until the first three months of '61." Total net income for the quarter was up more than 150%, to $574,074; but this was because of the profit on the sale of the Ris-Van fertilizer operation to Armour & Co. and on the sale of nonproductive mining properties in South Dakota. For A. E. Staley Mfg. Co., six-month sales and earnings were off only slightly, to $76.1 million and $2.5 million, respectively. For Chemetron Corp., sales dipped 8%, to $30.8 million; profits shrank 49%, to $613,875.

Kawecki's Abeles: He seeks funds to finance a new home for columbium.

Money to Grow On

Kawecki Chemical Co. (Boyertown, Pa.) is offering $3.4 million worth of convertible debentures for public sale through Carl M. Loeb, Rhoades & Co., New York underwriter. The funds will be used mainly for expanding production of columbium and its alloys.

Kawecki President Joseph C. Abeles has taken over control of the company from cofounder Henry Kawecki. Kawecki, who is still a director, served as chairman of the board and technical director until the end '60.

Kawecki Chemical, whose products include refractory metals and semiconductors, has been producing columbium and its alloys in semicommercial quantities in its tantalum plant. But columbium sales (mainly for nuclear energy and high-temperature uses) rose last year, and even greater demand is expected this year. The new plant—due onstream later this year—will fill these expanding requirements. Other recent growth moves have doubled the size of the research lab and upped pilot-plant facilities 50%.

Kawecki will split its stock two-for-one next month. Each debenture may be exchanged for two of the new shares. If all 20,920 debentures are exchanged, the company will have 1,059,296 shares outstanding.

national roundup

Rounding out the week's domestic news.

Companies

Western Petrochemical Corp. (New York) is moving its headquarters to Kansas City, Mo., where it will consolidate research and development divisions now situated in New York, Newark, N. J., and Chanute, Kan. The move will be complete next January. Western is also expanding the polymer plastics division in Newark, expects sales to double. The company's refinery at Chanute, said to be the largest of its kind, produces wax used as a polish additive and to face paper and paper cartons.

B. L. Lemke & Co. (Lodi, N. J.) has declared a 5% stock dividend and plans to add 15 new products to its line of fine chemicals by early '62, despite strong foreign competition. Additions will bring Lemke's total number of chemicals to 65.

California Corp. for Biochemical Research (Los Angeles), with $1-million backing from two investment firms, plans to start producing fine organic chemicals. Calbiochem, a nonprofit foundation for research in biochemistry from '52 to '58, now produces research biochemicals, radioisotopes and enzymes.

U. S. Borax & Chemical Corp. has signed a long-term lease agreement for a 275,000-sq.ft. office and parking structure to be built as its new headquarters in Los Angeles. The nine-story building will be ready early in '63. The company is also starting expansion of its Boron, Calif., installation to increase production of primary and specialized borax products.

Expansion

Fertilizer: American Humates Inc. (Dallas) has been awarded leases on more than 4,000 acres of federal coal-bearing land north of Glenrock, Wyo., where it will construct a 75-tons/day commercial fertilizer plant this fall. Between 200-300 tons of coal will be mined daily and processed into concentrated humus grains. The company says the coal has unusually high content of nitrogen and oxygen. Product will be sold only to fertilizer companies and distributors.

LPG Hydrocarbons: Cooperative Refineries (Regina, Sask.) is boosting its crude-oil capacity from 16,000 to 22,500 bbls./day with a three-year, $1.3-million construction program. Refinery Engineering Co. (Calgary, Alta.) has started the main job—enlarging the crude-oil-processing and catalytic-cracking facilities. In '62 and '63 the firm will add more storage facilities and product-treating and gas-compressing equipment.

Cement: Arkansas Cement Corp. (Foreman, Ark.), subsidiary of Arkansas Louisiana Gas Co., plans to double its output to 2.8 million bbls./year by adding a second kiln and other equipment. The $7.5-million expansion is scheduled to be completed in a year.

LPG Hydrocarbons: Carstairs Operators' Committee has named Fluor Corp. of Canada to design and handle construction of a $3-million expansion of its 70-million-cu.ft./day gas-processing plant near Carstairs, Alta. The product recovery unit will remove 7,000 bbls./day of natural gasoline from the gas stream. Completion target: November.

Lime: Dominion Tar & Chemical Co. (Montreal) will start construction of two new lime kilns—one in Tacoma, Wash., the other at its plant in Joliette, Que. Both of these $2-million projects are expected on-stream early next year and will be operated by Dominion's Gypsum, Lime and Alabastine Division.

foreign roundup

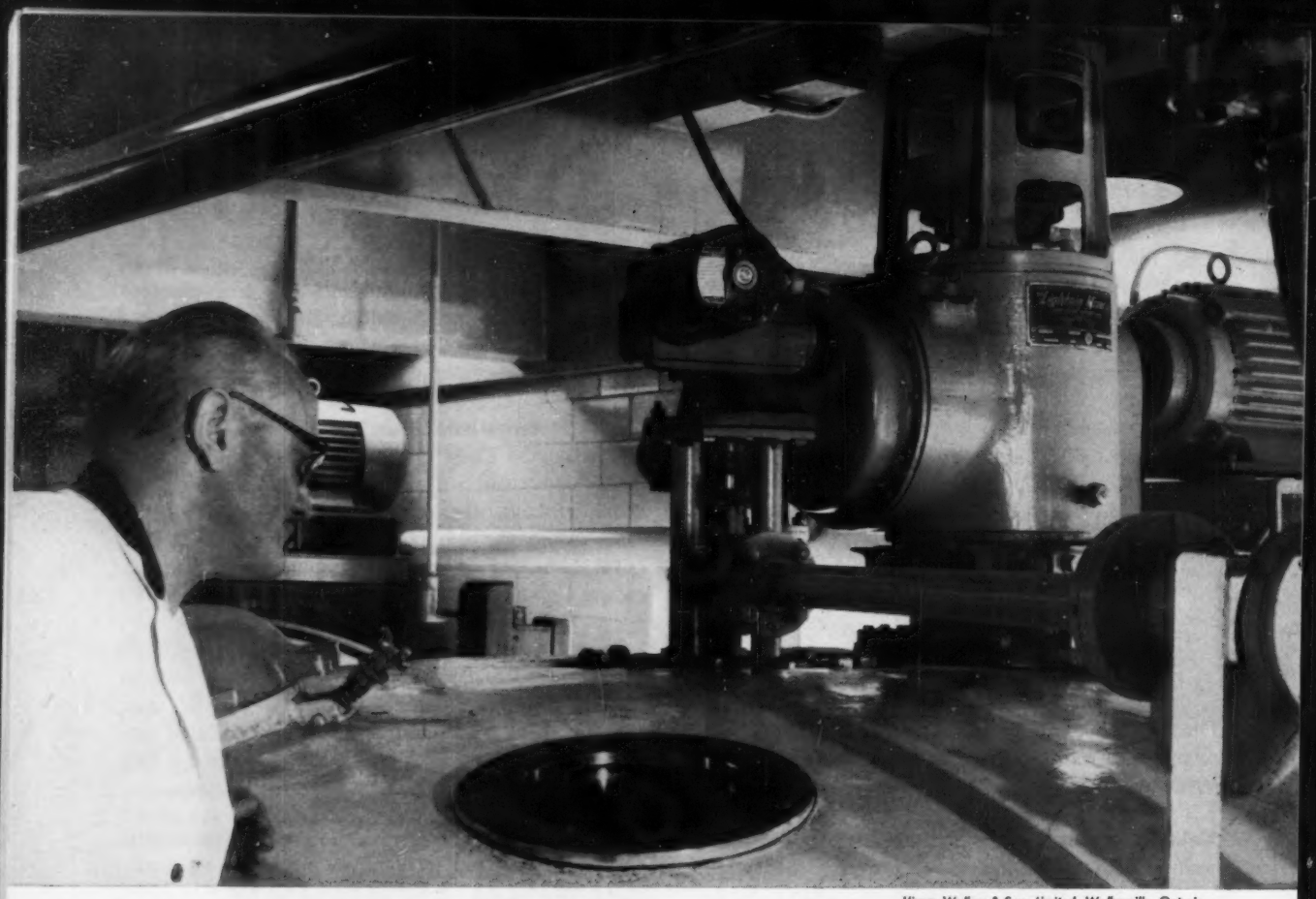
Rounding out the week's international news.

Petrochemicals/Japan: The Japanese government has approved capital spending totaling $324.4 million for Japan's petrochemical industry in '61, up 303% from last year. The money is for the expansion projects approved late last year for 42 petrochemical and related firms. Among the projects: more naphtha crackers and facilities for making propylene derivatives; and conversion from coal into petroleum raw materials for production of acetaldehyde, acrylonitrile, butanol and other products.

Detergents/France: Procter & Gamble Co. has purchased a synthetic-detergent and soap-products plant in Marseilles. The company has been renting part of the plant since '55 and had installed a synthetic-detergents tower in the rented part.

Synthetic Rubber/Netherlands: AKU and Goodrich are reported to be preparing to double the capacity of the Ciago synthetic rubber plant at Arnhem to 30,000 tons/year. The plant is a joint AKU-Goodrich venture.

Sales/East Africa: Dow Chemical International is opening a new sales office in Nairobi, Kenya, to serve countries in the East Africa area.



Hiram Walker & Sons Limited, Walkerville, Ontario

Canadian Club begins with good mixing

This big yeast tank is Step One in a process that develops and protects the unique qualities of Canadian Club whisky.

In six tanks like this one, the yeast incubates 24 hours in a medium of sterilized malt, rye, and water under conditions of surgical cleanliness and strictly monitored temperature.

A turbine-type LIGHTNIN Mixer keeps the culture medium in constant, even flow to insure uniform temperature throughout each of the big jacketed tanks.

Slurrying, cooking

While yeast propagates, another LIGHTNIN Mixer rapidly slurries barley malt in water, suspending the fine grains in a homogeneous, lump-free mixture that permits close control of available enzyme content.

Concurrently, 12 more LIGHTNIN Mixers mounted on four cereal cookers keep heat uniform as live steam cooks grain starch to a mash. Mixing continues at constant speed despite an extreme jump in viscosity as the hot mash is flash-cooled.

Reacting, fermenting

Next, cooled mash and malt slurry meet in converter tanks where LIGHTNIN Mixers assist the starch-enzyme reaction by holding ingredients in a uniform dispersion.

Finally, maltose-rich mash is mixed with the 24-hour-old yeast in conical-bottom fermenter vessels. After fermentation the fermented mash is pumped to beer wells where bottom-mounted propeller-type LIGHTNIN Mixers keep the insoluble grain particles in complete and uniform suspension. From beer wells the mash is fed continuously to distilling columns.

What user says

"LIGHTNIN Mixers are selected throughout our plant," declares Frank D. Leeder, superintendent of manufacturing and maturing at this Hiram Walker distillery, "because they meet our requirements for trouble-free service, performance, and sanitary maintenance—and, of equal importance, the service we receive when we have a problem. MIXCO makes their machines work. Our experience with LIGHTNIN Mixers has firmed our belief that no one knows more about mixing than the people at MIXCO."

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Washington
Newsletter

CHEMICAL WEEK
May 20, 1961

A new Pentagon budget policy should mean fewer false starts on projects, fewer sudden orders to halt work. It is aimed at preventing a repetition of the fiasco involving the on-again, off-again borane high-energy fuel program of the Air Force and Navy. This project was canceled after well over $100 million had been invested in programs planned by Olin Mathieson and Callery Chemical Co.

The new budget plan, designed to put the military on a long-range planning basis, will work like this: between now and Oct. 1, Defense Dept. planners will decide which of the weapons systems best perform basic military missions. Decisions will be made for the long run. Once they are made, military budgeters will begin translating them into dollars for the fiscal year that begins July 1, '62.

The policy also is an obvious attempt to strengthen military unification and eliminate service rivalries. Before any final decisions are made, for example, the Air Force Minuteman missile will be compared with the Navy's Polaris. Or the Army's Pershing missile will be pitted against the advanced fighter-bomber developed by the Air Force. Budget Director David Bell wants to extend the idea to all government agencies handling research and production.

•

The Administration is committed to increased spending for both defense and space in fiscal '62. For the record, the most officials will say is that they are considering such a move next year. Actually, most of the decisions have already been made and will be embodied in a supplemental appropriation request to be sent to Congress soon.

President Kennedy has already tacked an extra $1 billion on the original Eisenhower defense budget for fiscal '62. Congressional support for such increased spending will not be lacking. Nor is there likely to be much opposition to Kennedy's plan to boost space spending by as much as $600 million. Most of the extra funds would go into the Apollo space project and nuclear rockets needed to land a manned expedition (Rover) on the moon.

•

The Air Force has reorganized its aerospace research setup to better handle its new responsibility for all major military space projects. Director of the Chemical Sciences Division is Amos G. Horney. Head of the Propulsion Research Division is Milton M. Slawsky. The mission of the Office of Scientific Research is the support of fundamental research by negotiating contracts, largely unsolicited, with the scientific community.

The reorganization follows the recent decision of Defense Secy. Robert S. McNamara to concentrate military space research and development in the Air Force. There are exceptions: present programs will be continued under the same military department or agency, and preliminary

Washington Newsletter

(Continued)

work on projects that may have direct application to specific requirements may be handled by the other services if the total does not exceed $200,000.

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All nonmilitary items needed by the Defense Dept. will in the future be purchased by the General Services Administration. A review of 30,000 such items is already under way. By June 30, '64, more than 150,000 items will have been reviewed. Those items (including chemicals) not requiring military control are involved.

•

Industry witnesses are opposing the Administration's tax credit plan for stimulating business spending on plant and equipment. Among the opposers: the Machinery and Allied Products Institute, several steel companies, and a variety of local and national trade associations.

The Administration's program is a hard one for industry to oppose flatly in many cases, since businessmen have been urging for years some kind of tax break to help them modernize and expand. But most want more liberal depreciation allowances (*CW Depreciation Report, March 25*), and are telling this to lawmakers of the House Ways & Means Committee.

MAPI's position is a good example of much of industry's feeling. The institute finds many flaws in the Administration's complicated tax credit plan geared to depreciation allowances. MAPI suggests that if a tax credit is finally adopted, it be a flat 10% tax credit based on all spending on new plant and equipment, without regard to depreciation. However, the institute much prefers that Congress set up a larger initial depreciation write-off on new investments—an allowance of at least 30% to be taken the first year.

The Manufacturing Chemists' Assn., whose representatives had been scheduled to testify before the House Ways & Means Committee this week, is now planning to submit a statement, but not until next month. While many members of MCA would benefit by the tax credit idea, the general inclination has been to oppose it in favor of more liberal depreciation. Now MCA officials and members are taking a longer look to see what their stand should be.

The outlook for the Kennedy tax package—which he wants considered as a unit—is very uncertain. Congress has to pass some kind of a tax bill if only to approve a continuation of the corporate income tax rate at 52% and the Korean excise rates on such things as liquor and tobacco. But there's more talk about holding the rest of Kennedy's bundle until next year, when the Administration will submit an even bigger program—overhaul of the entire tax structure.

•

"Handling and Storage of Liquid Propellants," a manual that was in wide demand in the chemical industry, has been put out in a revised edition by the Government Printing Office ($1.25). It includes safety, handling and storage information on 25 liquid propellants.

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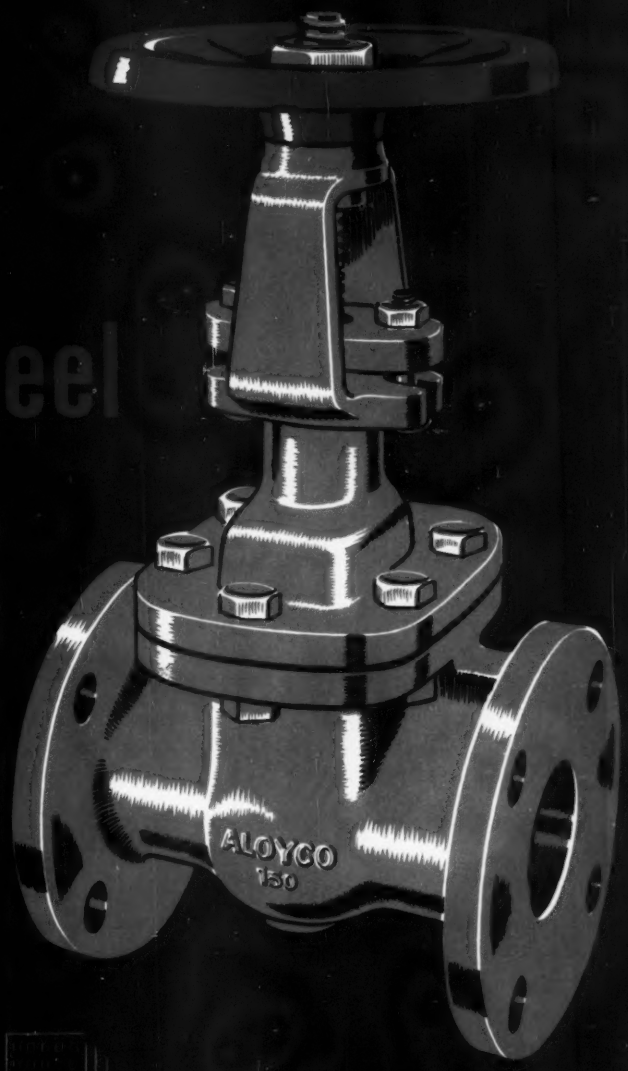

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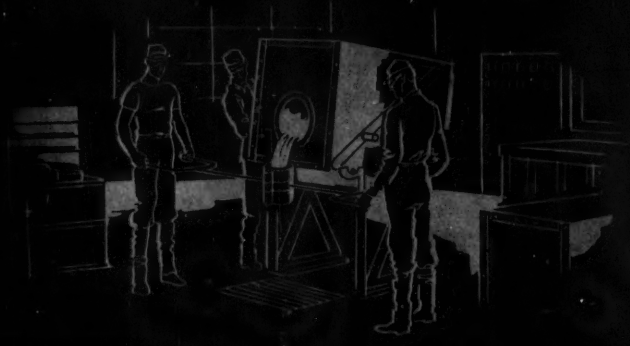

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Treasure Hunter in Canada's Drug Patents

How Fine Chemicals of Canada uses compulsory licensing to get into new product fields.

Some small Canadian drug-intermediate makers are regarded darkly by U.S. and Canadian pharmaceutical houses because of their use of the compulsory licensing feature of the Canadian patent law. None has received more baleful stares than Fine Chemicals of Canada, Ltd. Reason: it has been vigorous in using compulsory licensing to enter product areas covered by other companies' patents. This controversial subject has again broken out into the open in Canada.

D. H. W. Henry, director of research under the Combined Investigation Act, told Canada's Restrictive Trade Practices Commission that the drug industry in Canada is operating under conditions determined by the patent laws of the United States. By honoring patent control of ethical drugs, he says, the Canadian pharmaceutical industry is creating a monopoly situation in Canada.

Taking advantage of Canada's own patent laws, according to Henry, can prevent such a monopolistic situation. The patent legislation, he explains, provides for compulsory licenses to manufacture under patents relating to drugs and foods. But, he adds, the provision of the law (embodied in section 41 of the '35 Patent Act*) is seldom pursued.

Whether or not Henry's charges are true, the laws can be helpful to the small drugmaker, as Fine Chemicals' story shows. The company (since last June a subsidiary of S. B. Penick & Co., New York) has built itself into a $2-million/year concern by taking advantage of the compulsory licensing laws.

Not long ago, for instance, Fine Chemicals squared off in court against Parke, Davis over the latter's broad-spectrum antibiotic chloramphenicol (sold as Chloromycetin). Fine Chemicals won its case and this year went into production of chloramphenicol. This victory was the second the company had scored over Parke, Davis. In the late '40s, FCC with help from the Canadian patent commissioner, forced P-D to let it make the antihistamine diphenhydramine (sold as Benadryl). Parke, Davis appeals of the ruling were turned down in both the Exchequer Court and Supreme Court of Canada.

Independent Action: E. G. Dentay, a Hungarian immigrant who founded Fine Chemicals in '39 and is still its chief executive officer, is a strong exponent of an independent pharmaceutical chemical tradition in Canada. Aware that no small outfit can afford the research effort put out by the international drug houses, he has concentrated on convincing these large firms of the advantage of letting Fine Chemicals be the Canadian source of supply. But if he can't convince them, he compels them.

Most of the big international companies are vehemently opposed to compulsory licensing. They have the strong argument that compulsory licensing encourages some manufacturers of pharmaceutical products to sit back and let others do the research. If a new "wonder" drug is invented, the nonresearcher can get compulsory licenses for its manufacture—to "suck blood out of other's research" as one trade source describes it.

Parke, Davis President Harry J. Loynd tells CHEMICAL WEEK, "It was disappointing for us to learn that Canadian law does not protect the patent, as it's protected in the U.S. Canada's compulsory license law. . . permits anyone, I say anyone, to just drop in and apply for a license on anything he wants to make. Since the compulsory licenses were granted on Chloromycetin, one company is making a little there, two are shipping it in. They cut the price 30%, and we had no choice but to meet the price. We are not going to let somebody take that market away."

Despite such arguments, these drug companies have thus far had only moderate success making their views prevail. In a report on the patent act, made public last spring, the Royal Commission on Patents, Copyright and Industrial Designs decided that in an application for a compulsory license, the burden rested on the patent owner to prove that there were good reasons for refusing it.

Apparently the Royal Commission was particularly disturbed by the possibility of delaying tactics on the part of patent owners "in view of possibility of large profits on some patented foods and medicines, particularly drugs (where) a substantial delay may be of great financial advantage to the patentee." The commission took the stand that the absence of compulsory licensing enabled patentees to profit unduly from the suffering or ailments of others.

Not Alone: Fine Chemicals isn't the only firm that has used compulsory licensing to enter certain product areas; a number of Canadian companies have similarly taken action on the basis of section 41 of the Patent Act. These include Frank W. Horner Ltd. (against Parke, Davis) and Delmar Chemicals (against American Cyanamid). Of the four compulsory licenses approved by the Canadian Patent Office since 1935 (out of 14 applications), however, two have been awarded to FCC.

FCC's Dentay thinks opponents of compulsory licensing are short-sighted. If they were more willing to license instead of trying to corner the market, he says, they wouldn't be open to the charge of monopoly. He contends that under compulsory licensing the patent owner gets fair reward for its research through royalties and that this should be competitive advantage enough.

He also feels that compulsory licensing may not be as necessary in the future as in the past, that there's more understanding among pharmaceutical companies about the advantage of Canada having a pharmaceutical industry of its own.

Dentay, now 66, was born in Budapest, educated as a chemist and en-

* The relevant section of Section 41 reads: "In the case of any patent for an invention intended for or capable of being used for the preparation or production of food or medicine, the commissioner shall, unless he sees good reason to the contrary, grant to any person applying for the same, a license limited to the use of the invention for the purposes of the preparation or production of food or medicine but not otherwise . . ."

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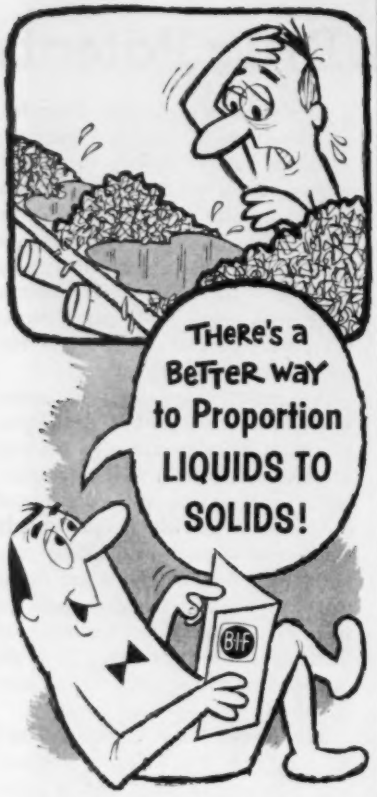

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gineer in Berlin and did his scientific research at Kaiser Wilhelm Institute there. He returned to Hungary, set up a pioneering asbestos processing company and later became the president of a company manufacturing soap and various other fat derivatives. In conjunction with I. G. Farben, his company was among the first to produce synthetic detergents in Hungary.

He went to Canada in '39, saw an opportunity in the production of chemicals used by pharmaceutical laboratories. At that time the only products of this kind made in Canada were inorganics such as iodides, bromides, bismuth mercury salts—but only a few organics. His initial backing came from J. S. McLean, then president of Canada Packers, and S. G. Bennett, president of Beardmore and Company, leather tanners (both sold their shares of the business to Dentay soon afterward).

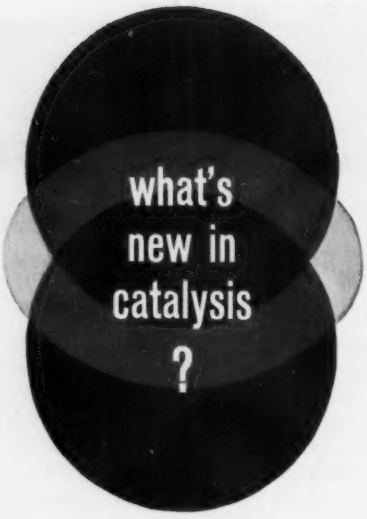
In '45 with a loan from the Industrial Development Bank, he started the present plant in Scarborough, a Toronto suburb. For further capital Dentay looked for more partners. Two British firms, Fisons Ltd. and Harrisons and Crosfield Ltd., became shareholders in FCC—S. B. Penick bought these firms' shares last year.

No Place at Home: The company's first sales were to customers in Cuba and Mexico. Gradually the company managed to find buyers at home as the cautious pharmaceutical industry overcame its wariness of a small outfit operated by a foreigner.

In the beginning manufacturing involved the processing of materials of animal origin—e.g., liver extracts; thyroid, ovarian and pituitary gland powders; enzymes such as trypsin; bile salts, and similar items.

In '46 FCC branched out into products of botanical origin such as cascara, senega, and white pine. This was accomplished without much difficulty, Dentay says, by slightly modifiying the equipment the firms used in processing products of animal origin.

Big Step: About '49 FCC started making wholly synthetic organic chemicals. Before this was accomplished, however, FCC "imported" chemists from Britain, Switzerland, and other countries because, Dentay says, personnel qualified in the synthesis of fine pharmaceutical chemicals



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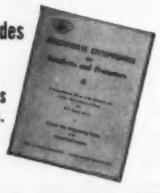

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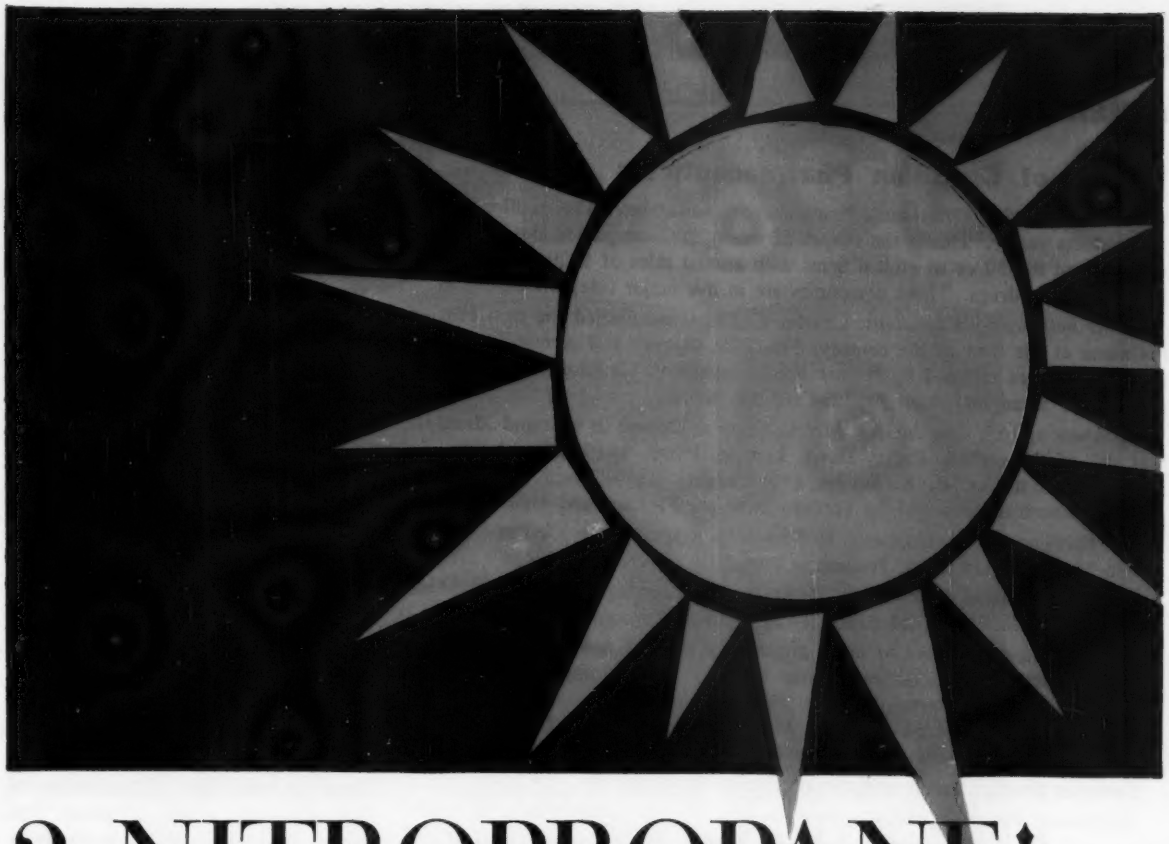

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Evaporation Rate of 2-NP Compared to Other Solvents (volume)

Acetone	975
MEK	568
Toluol	197
MIBK	186
2-NP	110
n-Butyl Acetate	100
Xylol	69
Cellosolve	38
Isophorone	4.3

Flash Points (°F Tag Open Cup) of 2-NP Compared to Other Solvents

Acetone	16
MEK	30
Toluol	56
MIBK	81
Xylol	85
n-Butyl Acetate	92
2-NP	103
Cellosolve	126
Isophorone	202

Comparison of Lower Limit of Flammability of 2-NP With Other Solvents (% by volume in air)

MIBK	0.9
Xylol	1.0
Toluol	1.27
n-Butyl Acetate	1.7
MEK	1.8
Acetone	2.15
2-Nitropropane	2.6
Cellosolve	2.6

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DIMENSION

Profile of Canadian Pharmaceuticals

The Canadian pharmaceutical industry turns about $175 million worth of products yearly. This is the output of nearly 200 companies, but most of it comes from the 50 or so ethical firms with annual sales of $120 million worth of prescription drugs. These companies are in five major categories:

Firms built up by Canadians: Charles E. Frosst established the firm bearing his name at the turn of the century; Frank W. Horner and Ayerst, McKenna & Harrison were initiated by former Frosst associates. Casgrain & Charboneau (Montreal) is an important French-Canadian house.

Offshoots of U.S. drug houses: Merck, Sharp & Dohme in west-end Montreal was one of the earliest. Parke, Davis, Lederle, Pfizer, Smith Kline & French, Abbott Laboratories, E. R. Squibb and Schering are all located in the St. Laurent suburb of Montreal. In Toronto there are Eli Lilly and Upjohn.

The European-based companies: Hoffmann-La Roche, Geigy, Ciba and Sandoz (all in Montreal) are Swiss; Poulenc is French.

The British-owned subsidiaries: These include Burroughs Wellcome (Montreal), Glaxo-Allenburys and British Drug Houses (Toronto).

Pharmaceutical divisions of large proprietary houses: Arlington-Funk (U.S. Vitamin), Bristol Laboratories (Bristol-Myers), Mead Johnson and W. S. Merrell (Richardson-Merrell), Ortho Pharmaceutical (Johnson & Johnson), Warner-Chilcott (Warner-Lambert), Winthrop Laboratories (Sterling Drug) and John Wyeth (American Home Products).

Canadian product lineup approximate that of the U. S.:

Antibiotics: Penicillin and streptomycin were the first antibiotics to be made in Canada. Ayerst, Connaught Laboratories (University of Toronto) and Merck have closed their fermentation units due to slumping penicillin prices. Lederle makes Aureomycin and Fine Chemicals turns out chloramphenicol. Antibiotics probably represent 20% of the drug market.

Vitamins: Making vitamins and formulating preparations is an $18-20-million/year business for companies such as Merck, Hoffmann-La Roche, Frosst, Ayerst, Abbott, Lilly, Mead Johnson and Parke, Davis.

Steroids: Ayerst, Frosst and one or two other firms process steroids. Basic materials are not made in Canada. Merck, Lederle, Upjohn and Schering are major factors of finished drugs.

Tranquilizers: All the important ataractic drugs are available in Canada but they haven't caught on there as they have in the U.S. Potential, however, is figured at $25 million by '65.

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Beauty Boom in Britain

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Perfume sales, accounting for 10% of the output, rose 12%, to $11.3 million (£4 million). Sales of toiletries also climbed about 12% in '60, to $102 million (£36.5 million).

The biggest rise—14%—took place in hair products, sales of which increased to $44 million (£15.8 million). Part of the gain came as a result of higher prices.

Smaller gains were made in export sales of toiletries. Exports totaled $27 million (£9.7 million), only 1% more than in '59. About 25% of British toiletry products are exported.

REPLACE

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At last you can replace costly, space-consuming fibre drums, and other rigid-type containers. For the first time, the protection of polyethylene and the strength of rugged multiwall have been successfully combined to give **complete** moisture protection in the packaging and shipping of hygroscopic and other "difficult-to-package" products... plus elimination of many corrosion and contamination problems. This process utilizes a **seamless** polyethylene tube integrated with the multiwall... then sewn and heat-sealed above the sewline to give **perfect sealing** . . . keeps product quality constant from packing through final use!

The Raymond MPS (Multiwall Perfect Seal) shipping sack has already met the critical requirements of storing and shipping such diverse products as milk replacers, refractory cements, plastic resins, anhydrous sodium bisulphite, and others. Potential applications are seen for **any product** in **any field** that requires protection from or retention of moisture. Let Raymond's experienced packaging engineers work with you to put your "difficult-to-package" products in an economical, rugged multiwall... you may well realize substantial savings in storage, freight costs, and ease of handling, as well as drastic reduction in original package costs.

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DIMENSION

Profile of Canadian Pharmaceuticals

The Canadian pharmaceutical industry turns about $175 million worth of products yearly. This is the output of nearly 200 companies, but most of it comes from the 50 or so ethical firms with annual sales of $120 million worth of prescription drugs. These companies are in five major categories:

Firms built up by Canadians: Charles E. Frosst established the firm bearing his name at the turn of the century; Frank W. Horner and Ayerst, McKenna & Harrison were initiated by former Frosst associates. Casgrain & Charboneau (Montreal) is an important French-Canadian house.

Offshoots of U.S. drug houses: Merck, Sharp & Dohme in west-end Montreal was one of the earliest. Parke, Davis, Lederle, Pfizer, Smith Kline & French, Abbott Laboratories, E. R. Squibb and Schering are all located in the St. Laurent suburb of Montreal. In Toronto there are Eli Lilly and Upjohn.

The European-based companies: Hoffmann-La Roche, Geigy, Ciba and Sandoz (all in Montreal) are Swiss; Poulenc is French.

The British-owned subsidiaries: These include Burroughs Wellcome (Montreal), Glaxo-Allenburys and British Drug Houses (Toronto).

Pharmaceutical divisions of large proprietary houses: Arlington-Funk (U.S. Vitamin), Bristol Laboratories (Bristol-Myers), Mead Johnson and W. S. Merrell (Richardson-Merrell), Ortho Pharmaceutical (Johnson & Johnson), Warner-Chilcott (Warner-Lambert), Winthrop Laboratories (Sterling Drug) and John Wyeth (American Home Products).

Canadian product lineup approximate that of the U. S.:

Antibiotics: Penicillin and streptomycin were the first antibiotics to be made in Canada. Ayerst, Connaught Laboratories (University of Toronto) and Merck have closed their fermentation units due to slumping penicillin prices. Lederle makes Aureomycin and Fine Chemicals turns out chloramphenicol. Antibiotics probably represent 20% of the drug market.

Vitamins: Making vitamins and formulating preparations is an $18-20-million/year business for companies such as Merck, Hoffmann-La Roche, Frosst, Ayerst, Abbott, Lilly, Mead Johnson and Parke, Davis.

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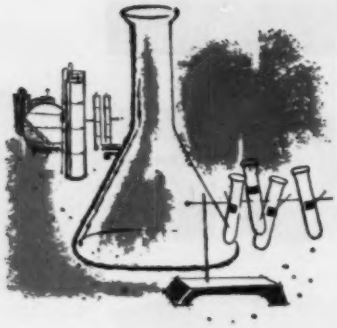

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For technical information and samples, contact Petrochemical Development Department, Cities Service Research and Development Co., Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE

Forest Spray

Beginning this week the antibiotic phytoactin will be used to spray national forests in northern Idaho and western Montana. Object: to control blister rust. Helicopters will apply the chemical to 11,700 acres in five forests this month, but eventually the spray will be used to protect an additional 1 million acres of western white pine valued at $1 million.

Phytoactin, a systemic antibiotic made by Pabst Laboratories, Inc., is absorbed through the needles into the vascular system of the tree.

Diepoxide for License

Union Carbide Chemicals (New York), in an effort to step up development and application of compounds based on its Unox Epoxide 201 (3, 4-epoxy-8-methyl- cyclohexyl methyl-3,4- epoxy-6-methyl- cyclohexane carboxylate), will license use of a number of its diepoxide resin patents. Included are covering polymerizable and polymeric compositions based on or containing Epoxide 201 or chemically related materials. UCC plans to charge either a fixed fee or a 2¢/lb. royalty on use of materials covered by the patents (U.S. 2,890,194-5,-7; 2,890,209,-10 and 2,917,469).

To promote immediate use of its 201, Carbide has made the yearly license fee particularly attractive—$250 until April '63, when it will go to $500. The 2¢/lb. royalty fee will likely be used for new products, for which patents have been applied.

Versatile Resin

A new film-forming resin has been developed by B. F. Goodrich Chemical Co. (Cleveland) for use in a wide variety of products, such as hair spray and paper coatings, and as a protective film for products being shipped or displayed.

Unlike other coatings, the film formed by the acrylic resin called Carboset 511, is said to be resistant to boiling water and yet easily removable with soap and water.

It can be applied to highly polished metal sheets, precision engine parts, mirrors, metal furniture, etc., as a protection against scratches during shipment and assembly. Good adherence is also noted for metal, glass, leather, Mylar, polyethylene and vinyl. Film can be washed off the product at its destination.

The resin is supplied as a 45% solution in water and is available also in alcohol solution.

Other uses envisioned by Goodrich: as a floor polish additive, clay binder in paper coatings, and ingredient in printing inks.

EXPANSION

Johnson Wax in Germany: S. C. Johnson & Son, Inc. (Racine, Wis.), has purchased West German maker of stove polish, shoe polish, window cleaner and floor wax, Grunol Chemie Werke, GmbH., near Dusseldorf.

•

New York Rep: Spatz Paint Industries, Inc. (St. Louis), has appointed E. C. Underwood (Pittsford, N.Y.) as its representative in upstate New York. Spatz makes coatings.

•

Export Agent: Sole Chemical Corp. (Chicago) has named Browning Chemical Corp. (New York) export sales agent for its emulsifiers, detergent bases and other specialties.

•

Plant Addition: The Specialties Dept. of R. T. Vanderbilt Co., Inc., has completed an addition to its plant in Norwalk, Conn. Warehouse capacity has been doubled.

•

Supermarket Soaper: Winn-Dixie Stores, Inc., Southern supermarket chain, will construct a 22,000-sq. ft. plant in Jacksonville, Fla., to turn out powdered and liquid detergents. Completion is set for October.

•

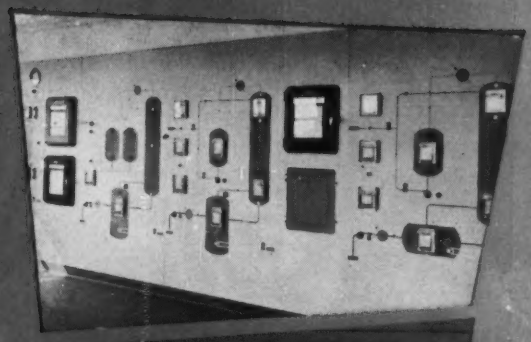
Androc Acquired: Chemical Research & Development Corp. (Boulder, Colo.) has purchased Androc Chemical Co. (Minneapolis), producer of pentachlorophenol wood preservatives. Price was not revealed.

•

New Division: Bee Chemical Co. (Lansing, Ill.) has formed a new division to market its Lacqua water-based spray and dip coatings through distributors and manufacturers' agents.

•

Pylam in New Plant: Pylam Products Co., Inc., maker of custom-blended colors and dyes, has moved to a new plant at 95-10 218th St., Queens Village, L.I., N.Y.



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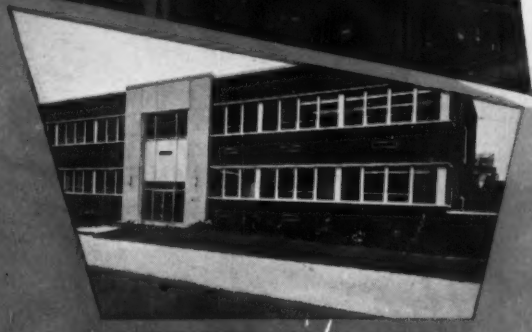
Lauroyl Chloride
Myristoyl Chloride
Oleoyl Chloride
Palmitoyl Chloride
Pelargonyl Chloride
Phenylacetyl Chloride
Propionyl Chloride
Sebacoyl Chloride
Stearoyl Chloride
and
others, made to order



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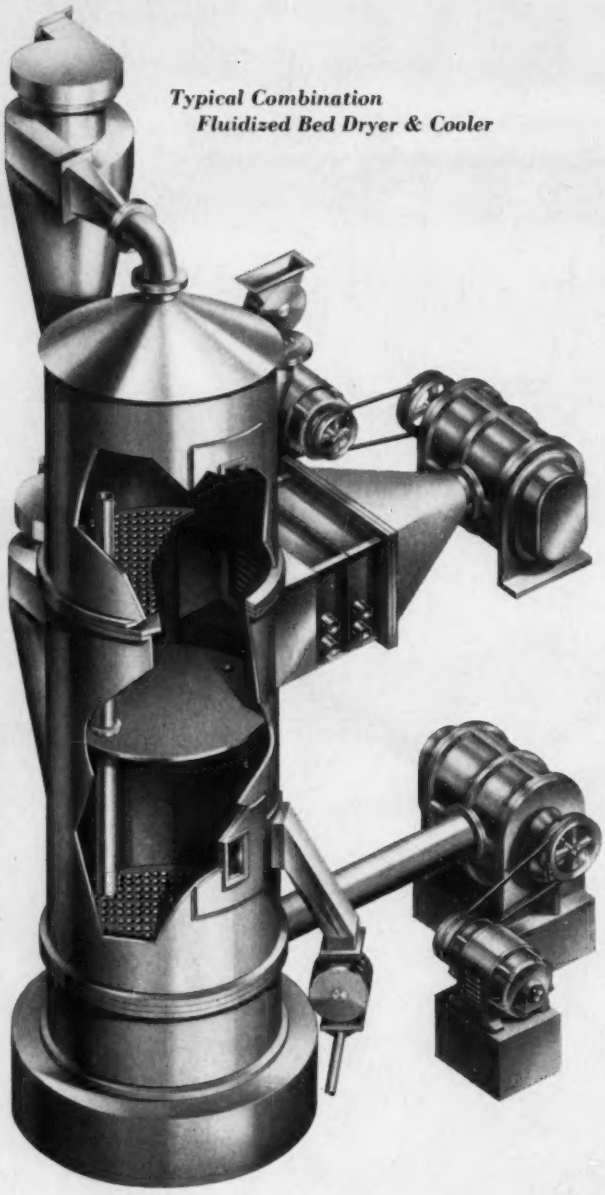

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Louisville Fluidized Bed units are meeting with unusual success as dryers, coolers and reactors for free-flowing granular materials up to ¼" particle size. Temperatures within the units are remarkably uniform. There are *no* hot spots. The high rate of heat transfer and the constant turbulence inherent in their operation create conditions that for all practical purposes are isothermal.

The operating range of Louisville Fluidized Bed Equipment is from 50° F. in the case of coolers to as high as 1500° F. in calciners and reactors . . . up to 2500° F. in special cases. By measuring and controlling exhaust temperatures, bed temperatures are maintained within narrow limits.

Response to desired changes is practically instantaneous. Because of this sensitivity to change, the critical temperature of the material being treated can be more nearly approached than in any other kind of dryer or reactor . . . as close as 2° F. in many operations.

For more information about Louisville Fluidized Bed Equipment, please write for Bulletin FBD-61

Process Equipment Division—Louisville Dryers

GENERAL AMERICAN TRANSPORTATION CORPORATION

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Cleaning Up Wet Scrubbers for CPI Service

Plant engineers are getting new help in a tricky assignment: choosing a gas cleaner.

In New York this week the two-year-old Industrial Gas Cleaning Institute is taking its first firm step. The group, composed of gas-cleaning and dust-collection equipment makers, is preparing a long-needed set of standards aimed at helping industry meet toughening air-pollution laws by getting peak efficiency from equipment that cleans exhaust gases.

Of most immediate concern to the chemical process industries, as well as to the equipment makers, is a guide for purchasers of wet scrubbers. Because they have the widest range of efficiency, wet scrubbers are one of the most applied—and misapplied—of all the types of gas-cleaning equipment (*see Dimension, p. 42*).

About 55% of all plants using dust and fume control equipment have wet scrubbers. The average cost of an installation is well over $10,000, but it ranges from $300 for a unit that is essentially nothing but a water spray encased in a "tin can" cylinder to $500,000 for a Venturi type, resembling a constricted pipe ringed with sprays, and auxiliary equipment such as pumps, filters, cyclones and cooling chambers.

Because the low-priced units are simple to make and effective to some degree, a number of firms lacking the proper engineering background have installed them. And some companies have put in the cheapest scrubbers possible—to show local air-pollution officials that something is being done, and to keep down their investment in nonproductive equipment.

But chemical companies are finding out that the cheapest scrubber may not be good enough to satisfy toughening air-pollution control laws. Today production management must buy the right scrubber or face possible plant shutdown.

But picking the right scrubber requires experience that few but the larger chemical companies possess.

At Procter & Gamble, for example, Floyd Byrd heads a four-man group that handles air, odor and waste-disposal problems. The group studies proposed and existing gas-cleaning installations, recommends scrubber types and operating changes. Byrd's unit spent almost two years developing proper techniques for measuring particles in gas streams—a prerequisite to an intelligent choice of cleaning equipment.

The smaller chemical companies generally cannot afford a full-time staff of this kind.

Alternatives:

(1) They can call in an established scrubber manufacturer that has laboratory facilities, such as American Blower, Research Cottrell and Chemical Construction. If the installation is a large one, the maker may run pilot-plant tests before making recommendations.

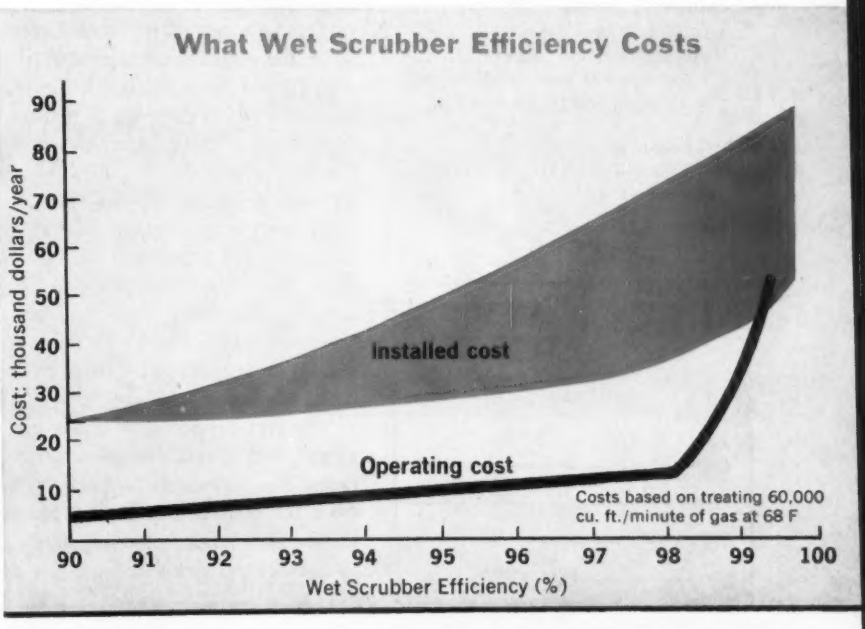
(2) Hire a consultant. Consultants fees are $100-150/day, plus expenses (or a flat fee for extensive jobs). But Lauren B. Hitchcock of Hitchcock Associates, chemical engineers, points out that a consultant can save money by avoiding equipment misapplication. The consultant studies the problem, gets the necessary information on particle density, concentration, flow rates, and particle size distribution. Much of this data is readily available in many cases but is not always easily interpreted. Some data must be procured by testing performed by analytical specialists. The consultant usually recommends a type of gas cleaner that is made by several manufacturers. The choice of vendor is left up to the purchaser of the equipment.

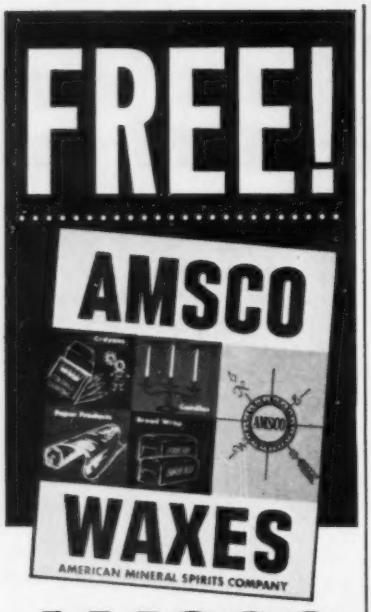
It's more economical for a company seeking a scrubber to duplicate one that has proved itself under similar dust conditions either within the company or in another company. But this has its drawbacks, since two problems, even with the same dust type, are seldom the same because of process equipment differences, temperatures, etc.

(3) The do-it-yourself method. After diligent study of all available literature some engineers design their own scrubbers. But savings in installed cost may be lost due to inefficient operation and lack of experience.

Besides wet scrubbers, gas cleaners include dry cyclones, bag collectors, electrostatic precipitators and

(*Text continues on p. 44*)





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Dust Collectors: What They Offer, What They Cost

	Dust Type and Size*	Pressure Drop**	Advantages/ Disadvantages	Initial Cost; and Efficiency
Dry cyclones	Fly ash (0.1-100) to wood dust (50-1,000)	0.5 to 6.0	Simple construction/ Low efficiency, wet dusts cause plugging	**$0.55-1.10/cfm; 65-90%**
Electrostatic precipitators	Steel furnace fumes (0.1-20) to oil mist (10-400)	0.25 to 0.50	High efficiency under severe conditions (650 F)/ High initial cost; operating difficulties (e.g., saturated gases cause mudding and shorting of electrodes	**$0.90-1.50/cfm; 85-99%**
Bag filters	Flour dust (5-100) to carbon black (0.1-100)	0.50 to 6.0	High efficiency over wide particle range/ Wet dust causes bag plugging; bag wear; bag fabric limitations (e.g., below 600 F)	**$0.80-2.00/cfm; 94-99.9%**
Wet scrubbers	Rock dust to chemical fume (0.1-50)	0.50 to 50	Wide efficiency range, reliable under severe conditions/ High operating cost; efficiency gained at expense of pressure drop; nozzle plugs; adding water to dust creates handling problems	**$0.35-5.00/cfm; 60-99.7%**

*In microns (1/25,400 in.) **Inches H_2O

How Different Gas Cleaners Work

Dry cyclones: Either centrifugal or impingement separators are used. In the centrifugal unit the gas stream enters through an inlet tangent to the side wall. The gas is given a whirling motion and the particles are thrown against the wall on which they collect and slide down. The impingement separators have obstructions—e.g., slotted plates or baffles—that slow the emission of particles.

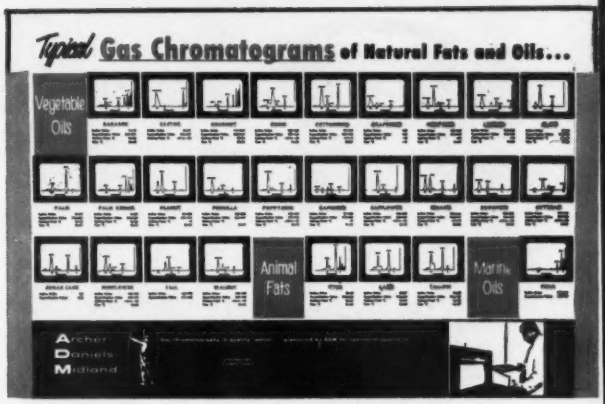
Electrostatic precipitators: Use of either the pipe or the plate type depends upon the physical arrangement of the electrodes. In the pipe type the electrode hangs vertically inside the pipe and the gas passes up through it. Dust collected inside the pipe is removed by rapping or with liquid. In the plate type, the collecting electrodes hang in the form of a curtain with the electrodes suspended at equal distances between them; rapping removed dust. In both cases the high-voltage electrode ionizes the particles so that they are attracted to the collecting electrode.

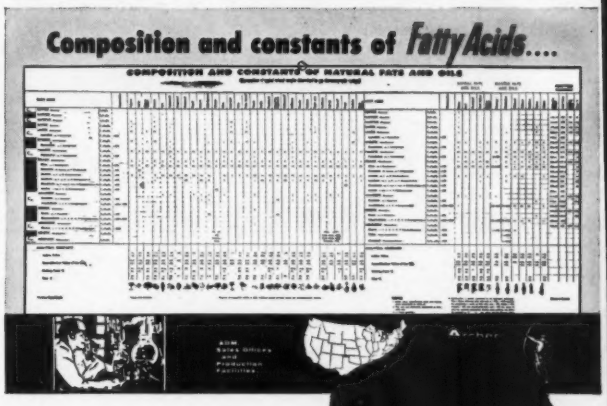
Bag filters: Deep bed and cloth filters are used. The deep bed's dense fibers collect the dust particles from the gas stream; the fibers are of wool, asbestos, cellulose, glass or iron. The cloth filter bags or envelopes are stretched over a frame. As the gas stream passes through the filter the particles are caught. The dust is removed periodically by a reverse flow, a jet or by shaking.

Wet scrubbers: Spray chambers, packed tower washers, mechanical, cyclonic, orifice and Venturi scrubbers, all use water to agglomerate dust particles. The water collects particles by impact and continuously removes them from the gas stream. Except for the mechanical type, which uses rotating blades, they have no moving parts. They use various arrangements of nozzles to contact the water and the gas stream.

Yours...from the pioneer of applied gas chromatography...

Two ways to look at Fatty Acid Quality





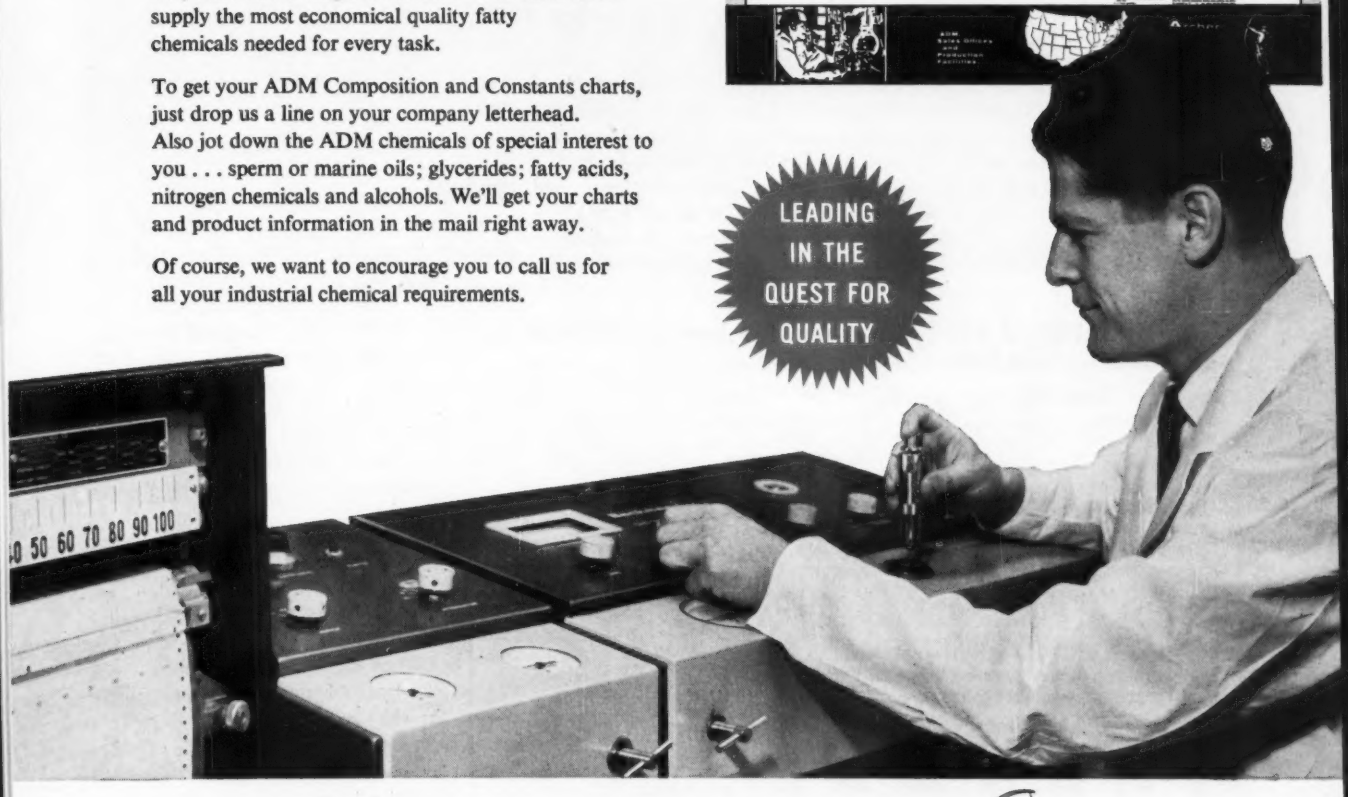
The composition and constants of natural fats and oils . . . pictogramed and charted for you by ADM through the use of gas chromatography. We'd like you to have these two 27″ x 17″ wall charts.

You'll find this information helpful in your work. Also, we want to assure you that ADM chemicals live up to these standards . . . shipment after shipment. And we want to remind you that ADM—the firm that developed gas chromatography techniques for analysis of fatty acids and nitrogen chemicals—will continue to supply the most economical quality fatty chemicals needed for every task.

To get your ADM Composition and Constants charts, just drop us a line on your company letterhead. Also jot down the ADM chemicals of special interest to you . . . sperm or marine oils; glycerides; fatty acids, nitrogen chemicals and alcohols. We'll get your charts and product information in the mail right away.

Of course, we want to encourage you to call us for all your industrial chemical requirements.

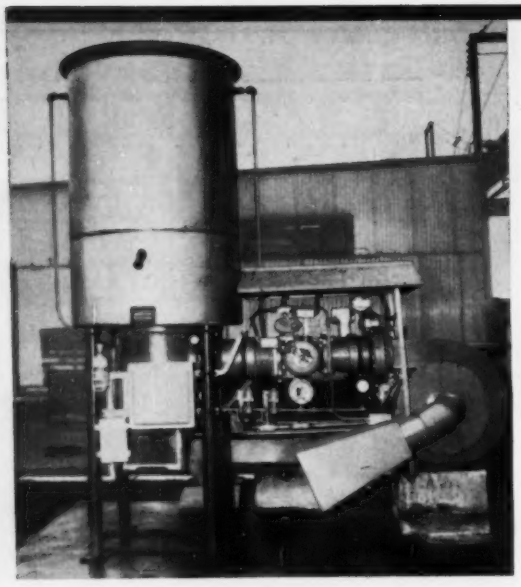
LEADING IN THE QUEST FOR QUALITY



Write to the Industrial Chemicals Dept. for ADM's new composition charts

Archer-Daniels-Midland

CHEMICAL GROUP
700 INVESTORS BUILDING
MINNEAPOLIS 2, MINNESOTA



Packaged THERMAL Waste Burner System installed at The Trubek Laboratories Inc. is used to burn waste solvents and mixed aromatics. It provides automatic and complete, odor-free incineration.

SOLVE CHEMICAL DISPOSAL PROBLEMS with a THERMAL WASTE BURNER SYSTEM!

Long established as one of the most efficient heat sources available to industry, THERMAL high heat release burner equipment provides rapid, efficient, economical incineration of combustible liquid and gaseous wastes. Because of its unique design, wastes can be fed directly into the burner, eliminating the need for bulky, expensive incinerators. THERMAL installations are compact, flexible and require minimum maintenance. Efficient heat recovery can also be arranged. Find out how this system can solve your waste disposal problems. Write today for information.

THERMAL WASTE DISPOSAL SYSTEMS have proved their effectiveness with these waste materials:

GASEOUS	LIQUID
Wax kettle fumes	Acetone-Acetic acid mixture
Phosgene	Ethyl alcohol
Smelter fumes	Phenol still residues
Hydrogen Sulfide	Diethylenetriamine Tar
Plastic plant wastes	Paint & Lacquer residue
Ammonia fumes	Organic insecticide wastes
Phthalic Anhydride	Nitrated & chlorinated aromatics
Acetylene, methane & hydrogen mixture	Ethyl ether
Carbon disulfide vapors	Dimethylformamide & formic acid
	Benzene

✳ Use THERMAL's extensive lab facilities for trial burnings of your waste materials. Our engineering staff is available to do complete turn-key designs to meet your specific needs.

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- Heat Exchangers
- Air Heaters
- Gas Generators
- Submerged Combustion
- Combustion & Heat Transfer Equipment

settling chambers. Gas stream characteristics are the key to the choice. For example, wet scrubbers are the likely choice if the particles represent an explosion hazard, must be wetted. High temperature may eliminate the choice of bags or electrostatics, and small particles (less than 10 microns) are usually not screened by a cyclone.

A wet scrubber could be the unit of choice for any one of four objectives:

(1) To conform to local air-pollution control laws. The final amount of dust or fumes in the scrubbed gas must be equal to or less than the law prescribes. If the scrubber won't do it, the investment is wasted.

(2) To recover valuable ingredients —e.g., amine from amine fog, or metallic oxides from blast furnaces —from the gas stream. In some cases the value of the recovered material may pay for most or all of the scrubber costs. An economic balance would tell the desirable scrubber efficiency in this case.

(3) To eliminate a nuisance or a potentially harmful ingredient from a waste gas. The efficiency required would depend on how clean plant policy dictates that the gas should be.

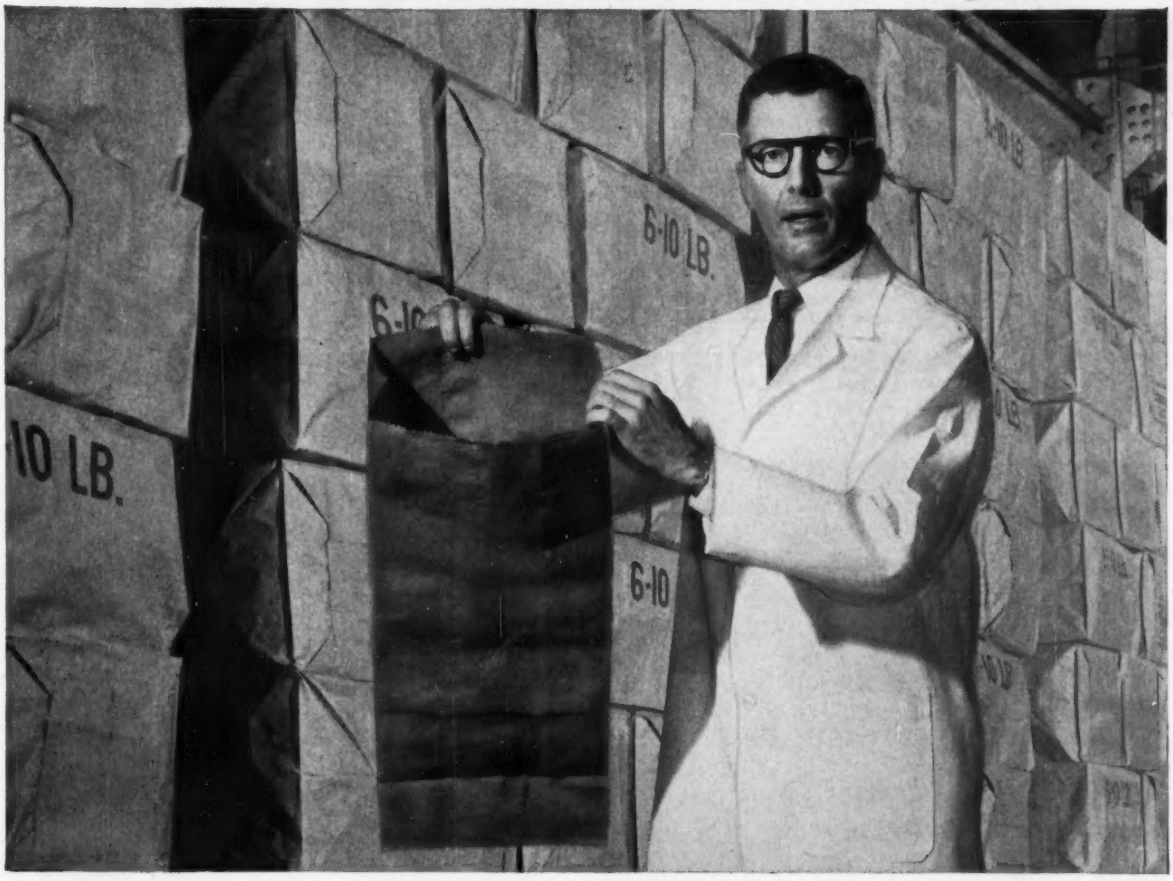
(4) To remove toxic and nontoxic submicron particles from emitted gases, to conform to pollution-control laws. Some officials of the Health, Education & Welfare Dept. feel that these ultrafine particles may eventually have a detrimental effect on health. Removing them will be expensive, requiring scrubbers with 99% efficiency. Although this factor is not yet critical, the chemical industry already is cleaning fluorine and chlorine fumes to parts per million concentrations before discharging the gas into the air.

Efficiency at a Price: To meet stricter air pollution-control laws the chemical industry is insisting on stronger guarantees that the equipment it installs will do the job.

When demanding a guarantee from a wet scrubber maker, plants specify the efficiency required over a particle size range—e.g., 95% of all particles larger than 50 microns, 95% of all particles larger than 10 microns, etc. They also specify the minimum particle concentration that is desired—e.g., 2 grains/scf.

The big question: How much will it cost to get required efficiency? The

Another Technical Advance from West Virginia



BALEX™

The New, Tougher, Lower Priced Baler

BALEX is a new and superior single ply shipping container made from a new, extra heavy kraft Clupak* extensible paper. It will outperform any single or double wall baler bag currently available, *yet cuts costs up to 10%*. If you ship almost any dry product—in pockets or in bulk—it will pay you to get the whole story on BALEX.

BALEX is the newest in a growing number of developments by West Virginia to provide better bags at lower cost. Some of the other recent technical advances are:

Impactape™ **closure**—drastically reduces sewn-end bag failure by adding four layers of tape to the sewn end.

Kraftsman™ **Clupak extensible paper**—pioneered the unique "stretchable" kraft that cuts bag breakage.

WONDERWALL™ **bags**—developed the technical knowledge needed to convert Clupak extensible paper into better and less expensive bags where lighter or fewer plies do more work.

West Virginia Pulp and Paper

Whatever your bag problem, we invite you to put it up to us. Multiwall Bag Division, West Virginia Pulp and Paper Company, 230 Park Avenue, New York 17, New York.

**Clupak, Inc.'s trademark for extensible paper manufactured under its authority and satisfying its specifications.*

Multiwall Bag Division, Dept. T951
West Virginia Pulp and Paper Company
230 Park Avenue, New York 17, New York

Gentlemen: Please send me more information on:

☐ Balex ☐ Kraftsman CLUPAK extensible paper
☐ Impactape ☐ WONDERWALL Multiwall Bags

For_____ (Product)

Name_____

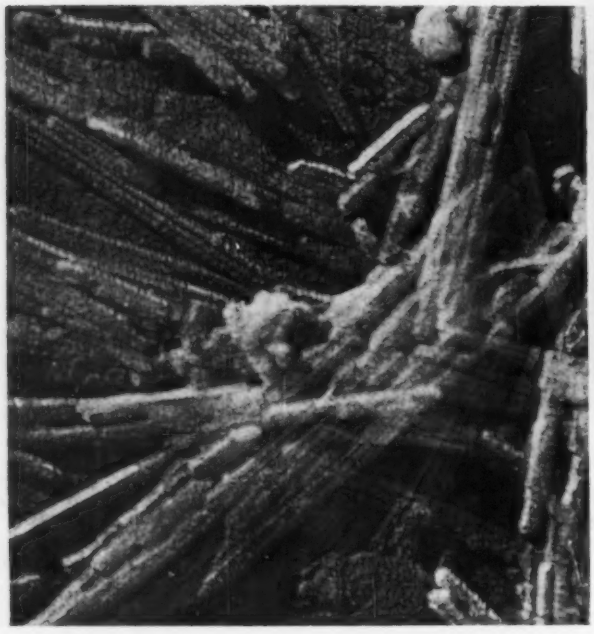
Company_____

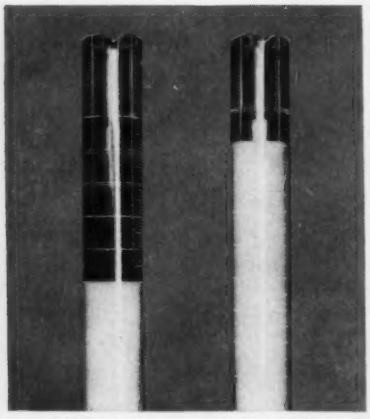
Street_____

City_____ Zone____ State_____

NEWS BRIEFS

ON THE CREATIVE USE OF





8-16-16
NO ATTAGEL 30

8-16-16
2% ATTAGEL 30

Typical high analysis possibility with Attagel 30 . . . 8/16/16 on furnace grade phosphoric acid. Similar results are possible with wet process acid.

High Analysis Liquid Fertilizers possible when stabilized with Attagel 30

Analysis limits in liquid fertilizers have been raised by the addition of Attagel 30 without troublesome settling-out problems. Higher amounts of trace elements, insecticide and herbicide salts and various other ingredients can also be added.

By adding only 1 to 3 percent Attagel 30 to the liquid, you can have a stable, pourable suspension which will retain its stability. Rich liquid fertilizers are then possible even where solubility has been a heretofore unsurmountable problem. For more information on its many uses, send the coupon.

Minerals & Chemicals Philipp

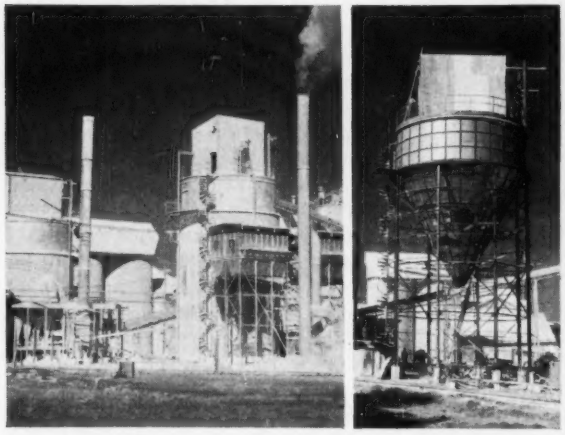
8846 Essex Turnpike, Menlo Park, New Jersey

EXPORT DEPT.: Room 150, Garden State Parkway, Menlo Park. N. J. (Cable Address: "MICOR")

ASP's... inexpensive products of many abilities

MCP aluminum silicate pigments (ASP's) are mineral products of controlled fine particle size which meet exacting standards as to freedom from contaminants such as moisture, sand, mica, and water soluble salts. Inert and insoluble under normal use conditions, they are applicable as extenders, blocking agents, fillers, and for other uses. Worth looking into for your product . . . just send the coupon.

MCP PROCESS MATERIALS



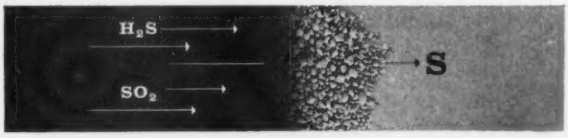
Spray Dried Coating Clay

capacity increased as MCP adds fourth unit

Kaolins that are spray dried during processing have a fine spherical bead that contains less than 1% moisture, flow readily, do not cake, and are easily fluidized.

MCP technologists were first (1947) to spray dry Kaolins used in the coating of paper. These high-purity, high-uniformity Kaolins have been so much in demand that three more spray dryers have been added in the last seven years. The latest, completed in 1961, gives MCP twice the number of spray-drying units as compared with any other clay producer.

With four such units, MCP offers a broad range of spray dried Kaolins to meet individual customer needs. Since all four are completely instrumented, MCP Kaolins are meticulously quality controlled, uniform in analysis, consistently easy to handle. They are applicable to other uses too . . . for more about them, send the coupon.



Sulfur Recovery Catalyst — Porocel

has enviable record in petroleum field

Petroleum refinery gases carry a large amount of combined sulfur. Since 1944 much of this sulfur has been recovered through the application of the Claus system of partial combustion of H_2S and a catalyst-promoted reaction of sulfur dioxide and hydrogen sulfide. MCP's catalyst, Porocel, has been identified with virtually all of the installations because of its excellent recovery performance— 92 to 97%, in purity of 99.97%.

Porocel is a thermally-resistant, high-grade bauxite. It is used in the petroleum industry for decolorization, adsorption, drying, brightening, defluorination, and other purposes. It has an excellent cycle life, long process life. For more information use the coupon.

MINERALS & CHEMICALS PHILIPP CORP.
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☐ Edgar Paper Clays ☐ Attagel 30
☐ ASP's ☐ Porocel Catalyst

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☐ data ☐ samples ☐ prices ☐ technical representative

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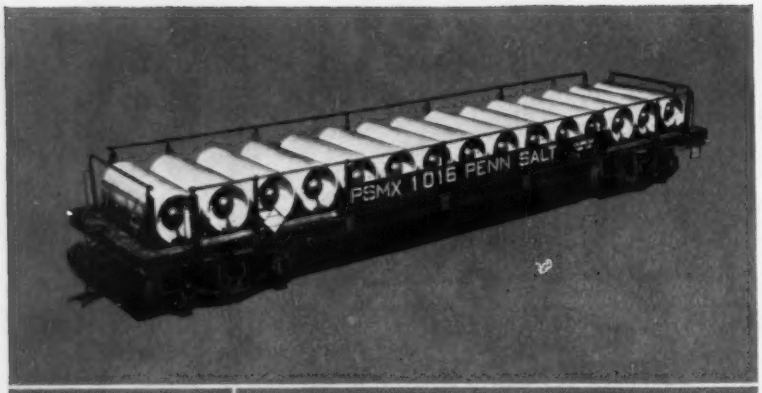
Use this quick two-check coupon . . .

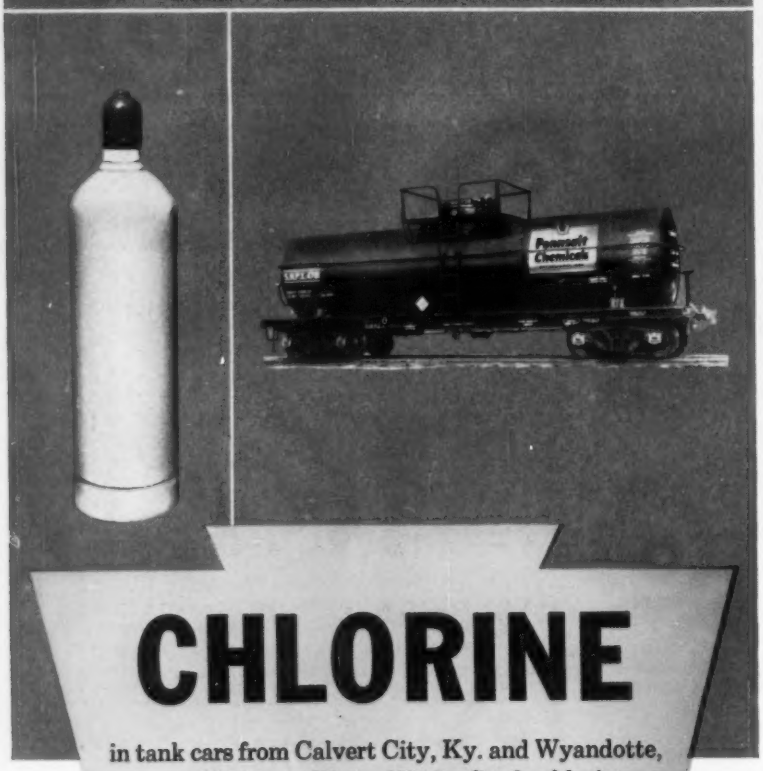
✔ for your product interest
✔ for what you need to get tests started

we'll fill your requests immediately

CORPORATION

For more data, see your 1961 Chemical Materials Catalogue, pages 423-430





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in tank cars from Calvert City, Ky. and Wyandotte, Mich. . . . Water Works Grade chlorine in multi-unit cars from Wyandotte . . . cylinders from Wyandotte, Cornwells Heights, Pa., and distributors throughout the East and Middle West. Handling and application aid on request.
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ESTABLISHED 1850

chart (*p. 41*) is a guide for estimating installed and operating costs at various efficiencies. Generally, as the gas flow increases, the over-all cost per cfm. of gas decreases; and conversely, as the flow decreases the costs per cfm. go up.

The installed and operating costs influence the over-all scrubber cost in different ratios, depending on the scrubber efficiency. Procter & Gamble air-pollution engineers Floyd Byrd and Joseph Walters say that generally the installed cost is the most important factor in the low-efficiency scrubbers, but for high-efficiency units—i.e., above 98%—the operating costs dominate the cost picture (the chart shows how the operating cost curve rises sharply at efficiencies above 98%).

Pressure drop across the scrubbing unit is the factor that sets operating cost. A large pressure drop results in a large loss of energy. This must be offset by larger fans and pumps, which require more power. And there is no way to increase efficiency without increasing pressure drop, says Howard Willet, head of Chemico's wet scrubber department.

Regardless of which type of gas cleaner is picked, the same injunctions apply: the problem should be approached scientifically, and the buyer should insist on appropriate guarantees—to be certain that when the equipment is put in it will stay in.

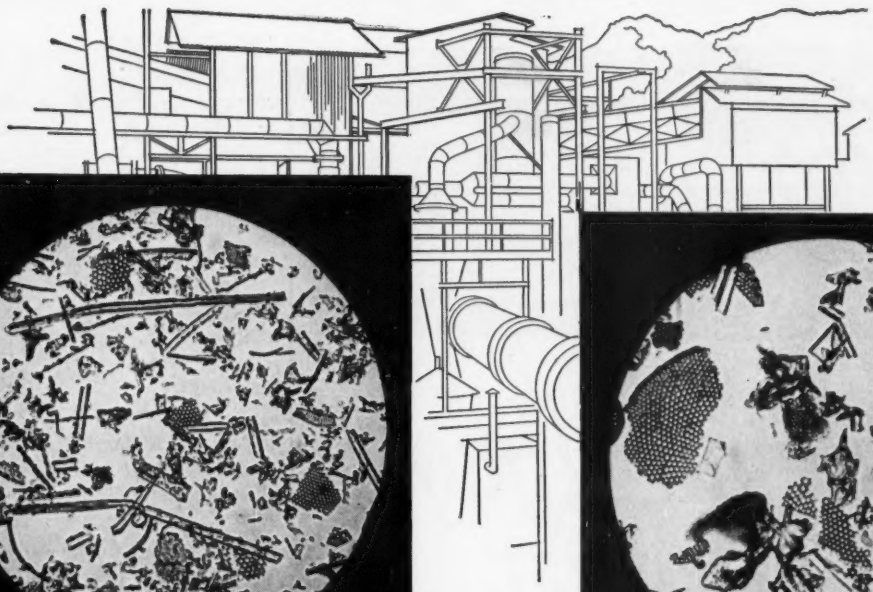
EQUIPMENT

Globe Valve: Alloy Steel Products Co. (Linden, N. J.) claims its new globe valve gives better throttling control and eliminates disc vibration and chatter.

Unlike conventional globe valves, it has a nonrotating stem, fixed disc and nonrising handwheel. A key prevents the stem from rotating, fits into the bonnet yoke. Since the key moves in relation to it, the yoke can be calibrated for throttling. Because the stem does not cut through packing, leakage is reduced. Stem misalignment and galling at the base of the stuffing box are said to be eliminated by pinning the stem and disc together. The valve is available in 150-psi. angle and Y types in addition to the globe type. Sizes: 2 in. and larger.

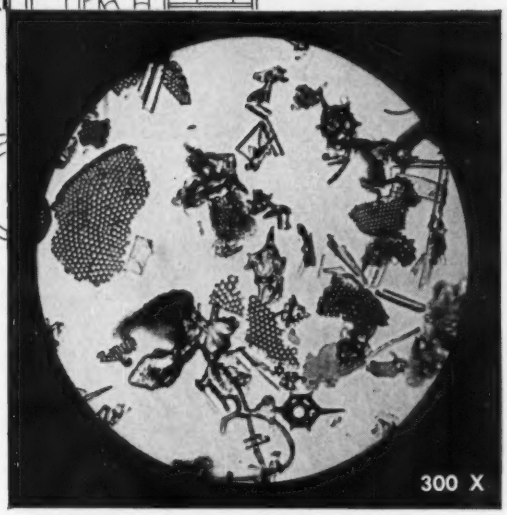
•

Conveyor Diverter: For more efficient, less costly diversion of an air-



Milling and calcining equipment used for all Celite grades.

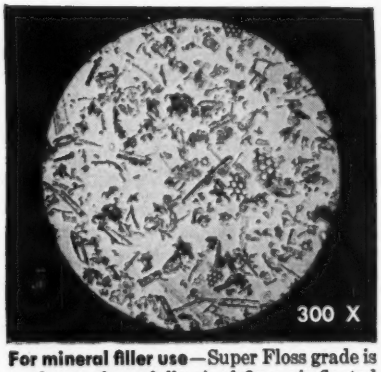
For high-clarity filtration of most liquids—use this specially milled diatomite, Hyflo Super Cel.



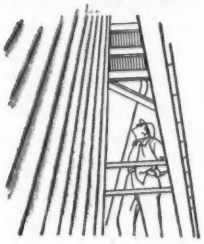
For filtration of larger suspended particles—Celite 545 combines maximum clarity plus faster flow rates.

In diatomites, Johns-Manville precision processing works for you

Constant uniformity in every grade of Celite assures consistent results, less down-time



For mineral filler use—Super Floss grade is made up of carefully sized fines air-floated off in the bag house.



Typical J-M bag house equipment.

As the microscope shows, each grade of Celite* diatomite has its own distinctive particle size distribution. Yet no matter where or when purchased, each remains uniform from bag to bag—your assurance of top production results with minimum down-time.

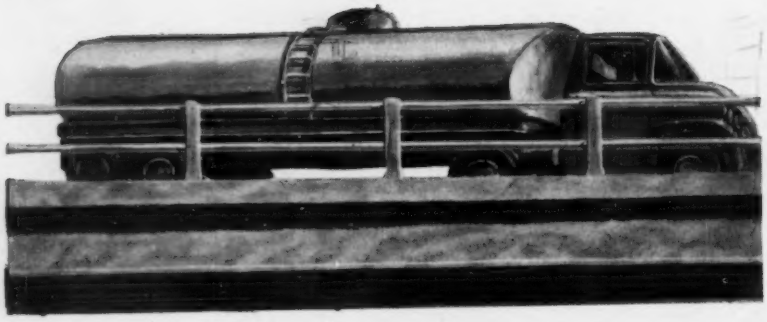
Three examples of flux-calcined Celites are shown here. Hyflo® Super Cel is widely used for filtration in many industries. It has just the right combination of coarse and fine particles to assure optimum clarity and flow rates. Celite 545, with a higher percentage of coarse particles, is used to achieve maximum clarity and faster flow rates with liquids that have larger suspended particles.

Super Floss, one of several bag house grades, has fine particle size distribution. A white powder, it is processed within very narrow tolerances (less than 1% retained on 325 mesh). It is a popular filler in fine products such as silver polishes.

Johns-Manville can precision-produce so many different grades of Celite because it mines the material from the world's largest and purest commercially available deposit. For assistance with specific filtration or mineral filler problems, talk to a nearby Celite engineer. Or write direct to Johns-Manville, Box 14, New York 16, N. Y. In Canada, Port Credit, Ontario.

*Celite is Johns-Manville's registered trade mark for its diatomaceous silica products.

JOHNS-MANVILLE



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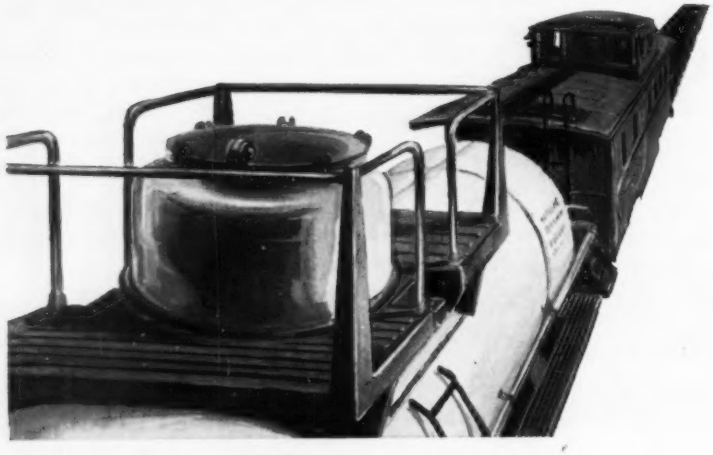


conveying stream of powdered and granular materials, Flo-Tronics, Inc. (1420 Zarthan Ave., Minneapolis) offers its new Flo-Seal line diverter. Movement of the unit's slide with an air cylinder permits selection of two ports in a stationary shoe. There is surface-to-surface sealing contact between the ground and polished slide and the shoe. The air cylinder requires 60-125-psi. compressed air for actuation.

•

Packaged Gas Turbines: Mission Manufacturing Co. (P. O. Box 4209, Houston, Tex.) is offering a "package" gas turbine setup in the 35-850-hp. range. The turbines, made by The Garrett Corp.'s AiResearch Manufacturing Division of Arizona, are combined with heat exchanger, operating controls and safety devices, mounted on a skid and enclosed for protection against weather.

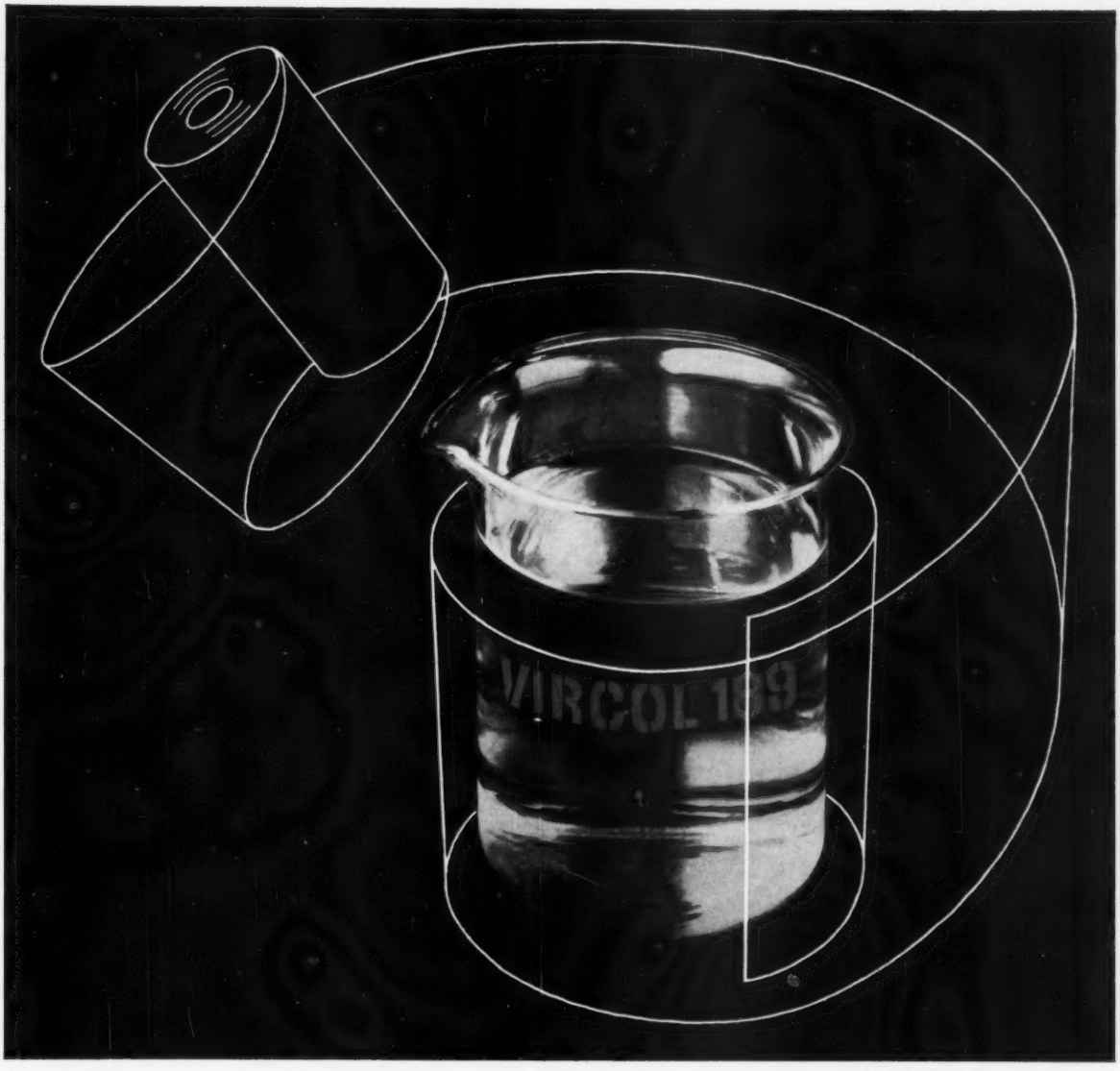
Three general types of turbines are available. One supplies energy in the form of compressed air, another in the form of shaft power and a third in the form of compressed air and shaft power simultaneously. Control systems are fully automatic. The units can furnish heat at 10,000 to 100,000 Btu./minute in free-flowing air up to 950 F or in compressed air from 90 to 500 F. Compressed air is developed at 30 to 350 psi.

•

Check Valve: Magnetrol, Inc.'s (5300 Belmont Rd., Downers Grove, Ill.) new full-flow, swing-check valve combines the advantages of flow control with a check valve in a single package. The valve called Model FCV, has a disc that is magnetically coupled to the mercury-contact switch mechanism. Position of the valve disc is indicated at all points from full-closed to open. Pneumatic pilot mechanism can be substituted for standard electric switch mechanism.

•

Gel-Time Measurement: Mol-Rez Division of American Petrochemical Corp. (3134 California St., N. E. Minneapolis 18) is selling a new control laboratory instrument for measuring the gel time of thermosetting resins. The unit's electronic circuit reads the gel time regardless of initial viscosity of resin. Measurement is made by automatic raising and lowering of a weight into the resin sample. Gelling stops the action.



Keeps PVA film from getting stuck on itself

V-C VIRCOL®-189 takes the troublesome adhesive tendencies out of PVA film. As a result, film production is speeded and new PVA applications are opened up, such as protective covers and interleaving sheets for stacking various materials.

VIRCOL-189 also greatly reduces moisture sensitivity. *PVA films plasticized by VIRCOL-189 absorb up to 50% less water!* In addition, this organic phosphorus chemical provides greater tensile strength, better retention of properties over a wide range of conditions, low volatility at higher temperatures, better heat and color stability, and increased flame resistance. What's more, it contributes these desirable features even when mixed with conventional plasticizers, such as glycerine.

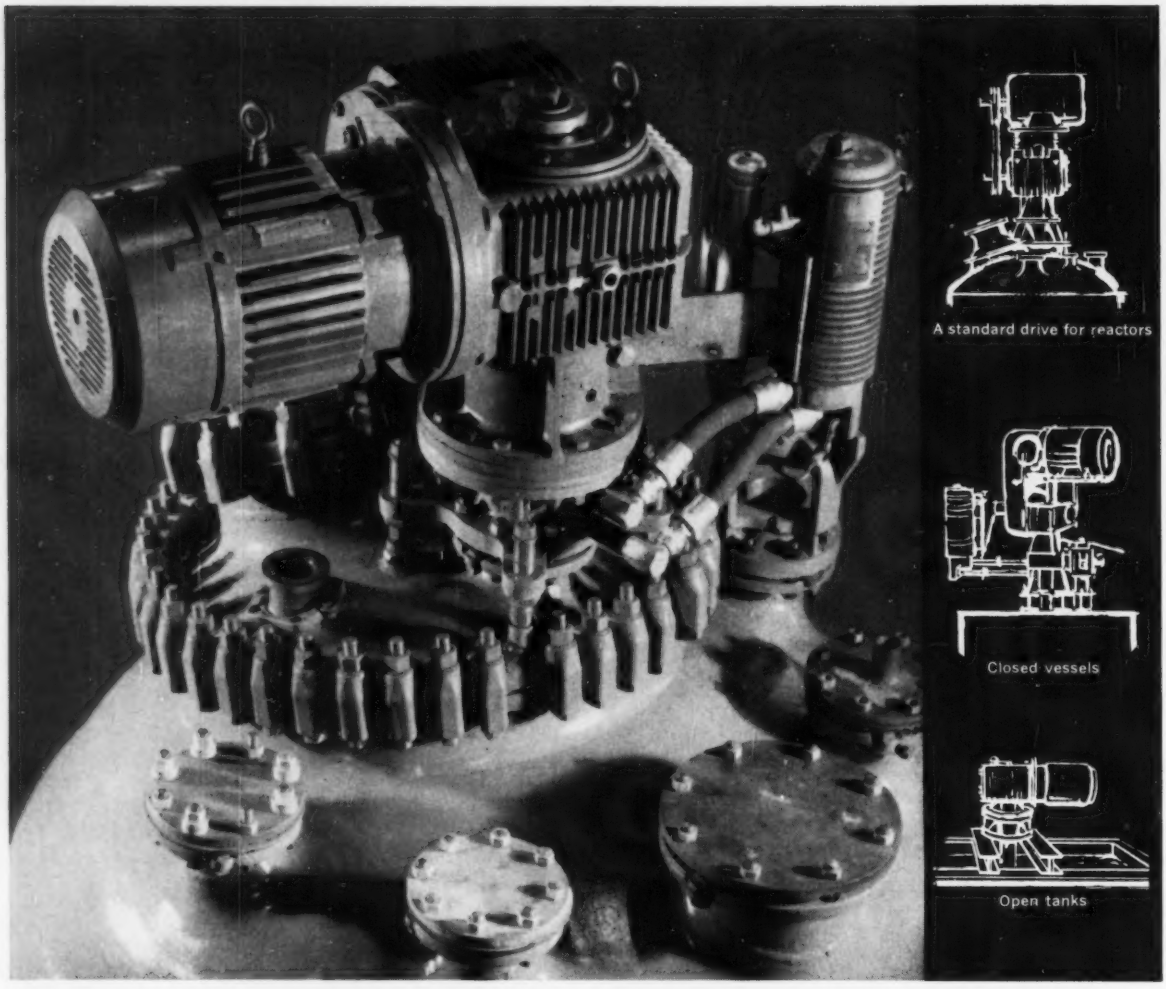
As a result, VIRCOL-189 is recommended for a wide range of PVA applications, including textile sizing, moldings, paper sizing, and coatings.

FREE booklet "V-C VIRCOLS" and samples are available on request. Write today and get complete information on VIRCOL-189.

Virginia-Carolina Chemical Corporation • Chemicals Division
401 East Main Street, Richmond 8, Virginia • Phone: Milton 8-0113

V-C® **VIRCOL-189**

FLUIDICS* AT WORK



It's a "compact" from Pfaudler . . . the new and versatile TW Drive

One look. That's all it takes to show you that this new Pfaudler® TW Drive truly deserves to be called a "compact."

The model pictured is the 7½ HP, Fixed Speed Gear, 5TW, mounted on a Pfaudler Glasteel reactor. Note how the compact, integral assembly serves as both drive support and housing for seal or stuffing box.

Note, too, the absence of bulky supports or other obstructions. Thus, lots of head room and easy access to top-head openings.

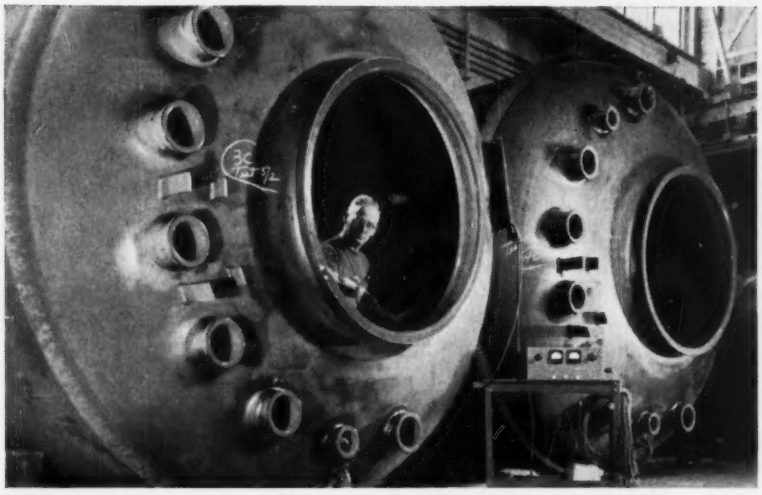
Versatile. Though it's small in size compared with many types of drives, the TW series can solve a variety of your agitation problems. You can use a TW on glassed steel or stainless steel reactors and on many of the agitated vessels in your plant. Open vessels need only a bridge for support. Closed vessels call for a standard nozzle with commercial pipe flange, plus support bosses.

Wide choice. Name the type of drive best suited to your application—fixed-speed gear, fixed-speed belt, variable-speed belt, variable-speed hydraulic. The TW is available in all of these types, in a complete range of agitator speeds and horsepower capacities.

It's a wise choice for your *standard* plant drive.

Common to all TW's, along with compactness are the following: (1) Maximum power for space and weight—because both worm and gear of speed reducer are throated for a larger contact area, (2) Quiet operation—since the large area of tooth contact assures accurate meshing and eliminates distortion, (3) Minimized agitator deflection—because where bending moment is greatest a large shaft diameter has been provided, (4) Long service life for seal and stuffing box parts. Housing serves as an integral part of the drive, so variations in deflection between component parts are minimized.

Summing up. The new "compact" TW Drive is one of a complete line of Pfaudler drives that offers economical, efficient answers to many of your agitation problems. Details are included in Bulletin 1001. For your copy, write to the address indicated on the facing page.



Glasteel reactors guaranteed full year against corrosion

This man is electric testing the interior of a Glasteel reactor. He's making sure that the product-contact surface is completely covered with corrosion-resistant Pfaudler glass.

That's the *glass* in Glasteel. The *steel* is outside, for working strength. Fusing the two together gives you a combination that lets you forget—not fight—corrosion.

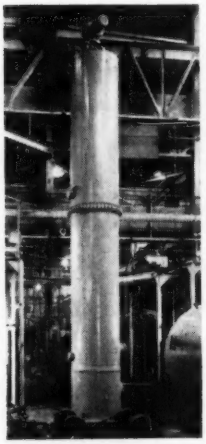
You can use Glasteel safely with all solutions of all acids except HF to 212° F (even up to 450° F for certain acid solutions, depending on concentration) and with many alkalies at moderate temperatures.

And you can do so confidently because Pfaudler Glasteel equipment is guaranteed against corrosion for a full year after shipment, when used under operating conditions specified and approved. If rendered unusable by chemical attack during this period, Pfaudler will repair or replace it, fob, factory.

Glasteel is also inert; it won't influence quality, flavor, color or purity of your products. And its smooth, abrasion-resistant surface resists build-up. So heat transfer is not impeded and cleaning is both quick and complete.

Standard Glasteel reactors are available with capacities from 5 to 4,000 gallons. Custom designs go to 10,000 gallons and larger. You can also get a variety of other process equipment made of Glasteel.

For details on reactors, ask for Bulletin 988. To bring your files up to date on *Glasteel*, it's Bulletin 985. Write to the address below.



Can you use a 32-foot-high, agitated, Glasteel polymerizer?

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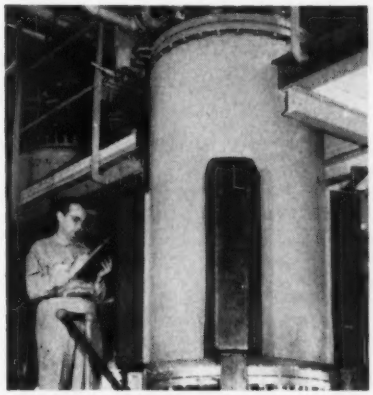
How tantalum helped Hoffmann-LaRoche scale up production

Here's the problem: You're making a relatively new drug, using a process that requires holding a mixture of phosphoric and hydrochloric acids at 385° F for several days.

You've been turning it out on a pilot-plant basis, using flasks. Market conditions require that you get into full-scale production. How?

The nature of the corrosive reaction narrows your choice to three materials: tantalum, gold, and platinum.

That's the situation Hoffmann-LaRoche Inc., Nutley, New Jersey, was up against recently. The practical answer: a 275-gallon, tantalum-lined reactor made by Pfaudler.



We say practical because tantalum is essentially inert and does not combine with the process ingredients to cause contamination. Practical because tantalum resists most acids, even at elevated temperatures. Practical because a .020" tantalum liner in a 5/16" carbon steel shell is reasonably priced.

And, finally, practical because Pfaudler brings to the fabrication of such equipment a wealth of experience and capability. We can and do work with tantalum, titanium and zirconium, so that you can look to these metals to solve your corrosion problems.

More facts? Bulletin 978 summarizes our activities in the "refractory" metals. We'd be happy to send you a copy.

Address all inquiries to: Pfaudler Division, Department CW-51, Rochester 3, New York.

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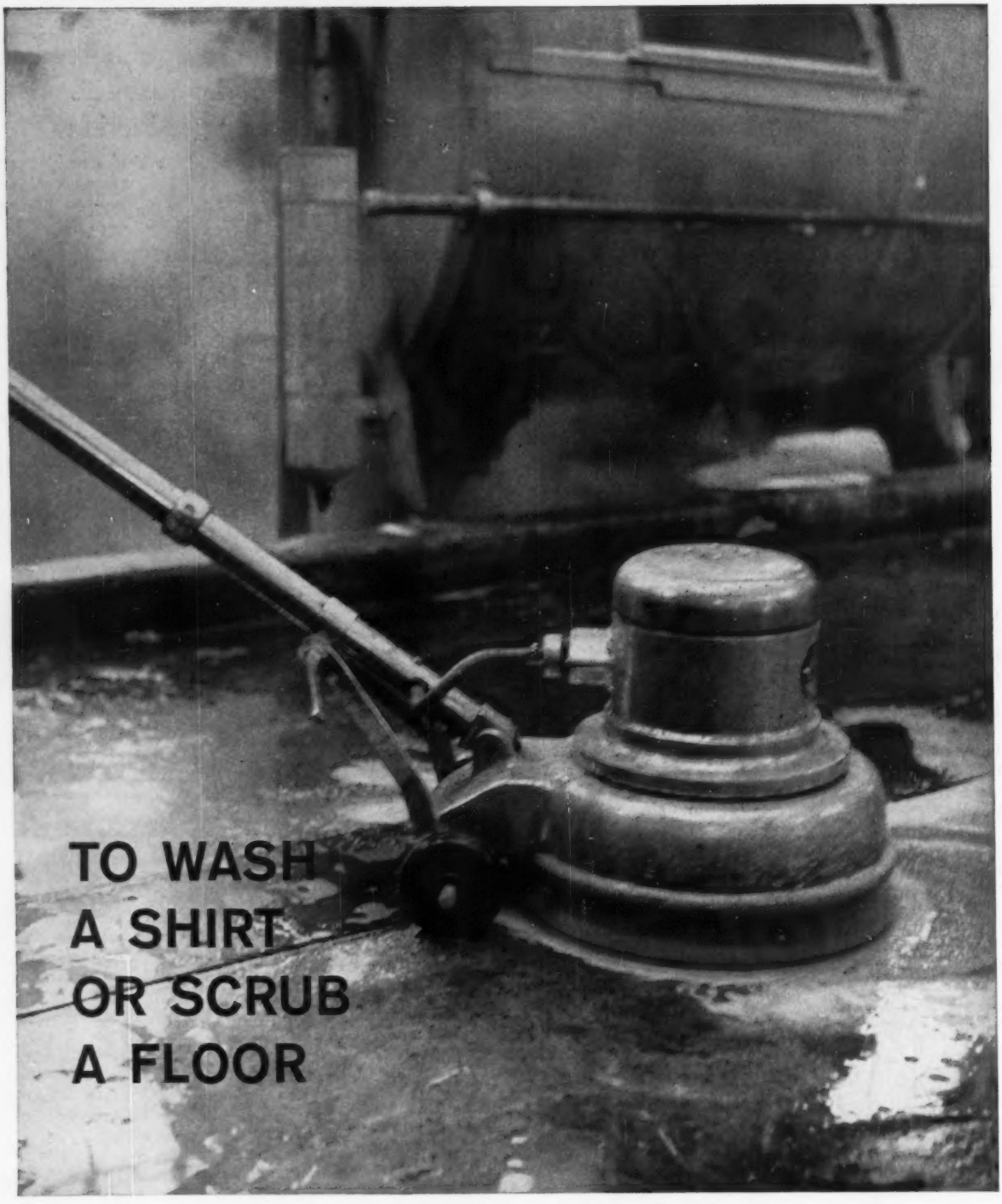

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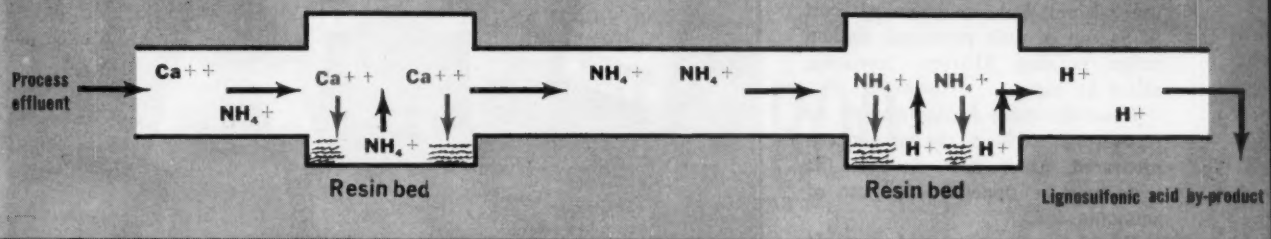
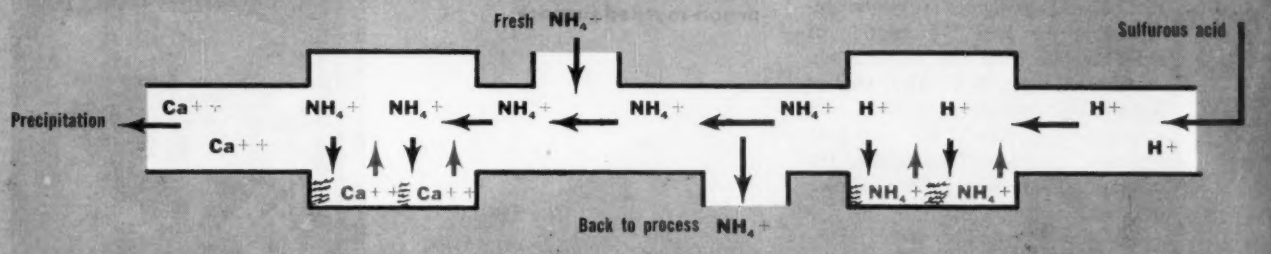
HOOKER CHEMICALS PLASTICS

Ammonium Ion Recovery in Sulfite Pulping: Two-Cycle Operation



1 — AMMONIUM REMOVAL: Calcium ions, then ammonium are taken out of the effluent by ion-exchange resins



2 — REGENERATION: Ammonium and calcium ions are taken out of resin beds, resetting system for first cycle

Ammonia Recovery: Bonus for Pulpers

A new process to recover ammonia from pulping effluent is economical, reduces pollution problems.

A new Canadian patent to J. F. Pritchard & Co. (Kansas City, Mo.) reveals first details of the company's novel process to recover ammonia (or sodium) from sulfite pulping wastes. Now that they may be recovered, ammonium and sodium sulfites may pose a challenge to the dominance of calcium compounds in the processing of some $850 million worth of sulfite pulps — current value of combined U.S.-Canadian output.

The process, developed by Ontario Research Foundation (Toronto) under contract to Pritchard and Fraser Co. (Edmundston, N.B.), is suitable for new plants and is adaptable to some existing mills. It is based on ion exchange, a principle not unfamiliar to the pulping industry. ORF's advance, however, is its "conditioning" step—the removal of troublesome multivalent ions of calcium, magnesium and iron before any effort is made to recover ammonium or sodium (monovalent) ions.

This preliminary step is necessary because calcium ions, for example, are preferentially absorbed when sulfite waste liquors are sent through a resin ion-exchange bed. Consequently, in attempts to remove ammonium with a single ion-exchange system, the beds become fouled with calcium ions. Replacing the resins or washing the bed with hydrochloric acid is too costly.

ORF's Solution: In the ORF process (Canadian Patent 618,158) calcium and other multivalent ions are first swapped for monovalent ammonium ions previously placed on the exchange resins (*see diagrams*). Then this ammonium-rich stream is passed through a second set of beds, where hydrogen ions on the resins are interchanged with the ammonium ions, and the recovery cycle completed.

There's a bonus to the economical ammonia recovery—the final hydrogen-ion-rich effluent also contains valuable, uncontaminated lignosulfonates, formed by lignin and part of the acid styrene sulfonic resin.

Continuous Action: To put the recovery system on a continuous basis, a bed cleanup and regeneration step is necessary. As the process is engineered, three beds are used in the first, calcium-holding step: two are regenerated at the same time by a combination of recovered ammonium ions and fresh ammonia. The calcium ions, replaced by ammonium ions, leave the beds and are precipitated out of the system.

There are four beds in the ammonium (or sodium) recovery phase; these are regenerated with a sulfurous acid solution; hydrogen from the acid moves into the resin and ammonium ions are recovered. Two beds in each set are in the recovery cycle at any

one time while the other two are regenerating. Changes in the pH indicate equilibrium states and control the progression through a cycle.

Old Cost Hurdle: Today sulfite pulping plants can use either calcium ammonium or sodium sulfites. Most use calcium. Calcium chemicals cost $1-$4/ton of pulp produced; sodium sulfite pulping, $13/ton; ammonia, about $6/ton.

However, these figures assume no recovery. If 65% of the ammonia is recovered, as is now claimed, the scale may be tipped toward use of ammonia.

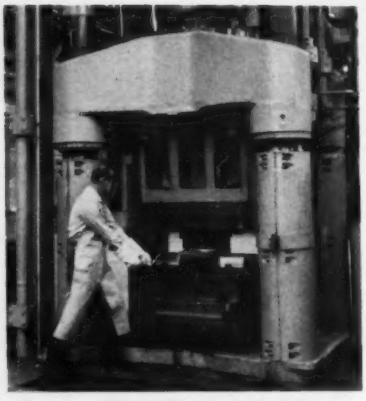
How fast can a recovered-ammonia system pay for itself? So far that question is unanswered. But some actual operating figures may be revealed at the June 7-9 meeting of the Canadian Pulp and Paper Assn. at Saranac Lake, N.Y. Also, various hypothetical operation figures are available from some of the many pulp producers that have long debated the calcium vs. ammonia sulfite pulping question.

One firm has studied such a hypothetical case—Midwestern mill operating on spruce wood—and has derived data for three cases of ammonia-based acid sulfite pulping: (1) with no chemical recovery at all, operating costs (exclusive of depreciation and interest on investment, as in all these cases) came to $139/ton, including $9.45 for chemicals; (2) recovering only sulfur dioxide, costs were $141/ton, of which about $7 was for chemicals; (3) with 65% recovery of ammonia and no recovery of sulfur dioxide, the total was unknown, with chemicals alone costing $6.14.

Thus, a recovery system would save $3.31/ton in raw materials in this theoretical case. Operating costs would use up some of the $3.31 and the rest would have to pay out the investment.

Actually, such an evaluation may be altered by several factors, such as particular plant locations and wood type. But it is an encouraging study, and shows why ammonia recovery systems are anxiously sought by pulpers (such systems are attractive too because effluents pose few pollution problems). And the ORF plan, with its double-series of beds and continuous operation, may be the answer to pulpers' need for economy and utility.

White-hot billet from argon-muffled furnace



. . . is hammered out in big high-speed forge.

Columbium's Challenge

Techniques used by the workmen in these pictures illustrate the special problems of fabricating refractory metals—in this case, columbium: the man in the heat-resistant apron (*top, above*) fishes a white-hot billet from an argon-muffled furnace, whirls and feeds a 2,000-ton high-speed forge (*bottom*), operated by a man at a console.

The forge and furnace, part of Du Pont's new, $12-million plant at Baltimore (*CW, May 6, '61, p. 98*), are needed to open some bottlenecks in the processing of refractory metals. The problems become clear when columbium-handling is compared with conventional metal-handling.

Like steel, the refractory metals (columbium, molybdenum, tantalum, tungsten) must be rolled, forged and extruded into usable shapes. Again as with steel, they are produced in the form of billets or ingots, then "broken down" at hot working temperatures. And also in the same manner as steel, the formed pieces must be annealed to rebuild crystals that have been deformed in working.

But there are some clear-cut ways in which refractory metals differ from steel:

• *Ultrahigh working temperatures*: Theoretical forging temperatures range from about 3000 F (for columbium) to 4000 F (for tungsten), compared with a top forging temperature of about 2350 F for carbon steel. This means that the refractory metals must be handled at temperatures above the softening point of conventional tool materials.

• *Ultrahigh purities*: All metals hold certain amounts of impurities (carbon, oxygen and alloys) in solid solution; they dissolve greater amounts when molten; and as they solidify, the excess over solid solubility precipitates out between the

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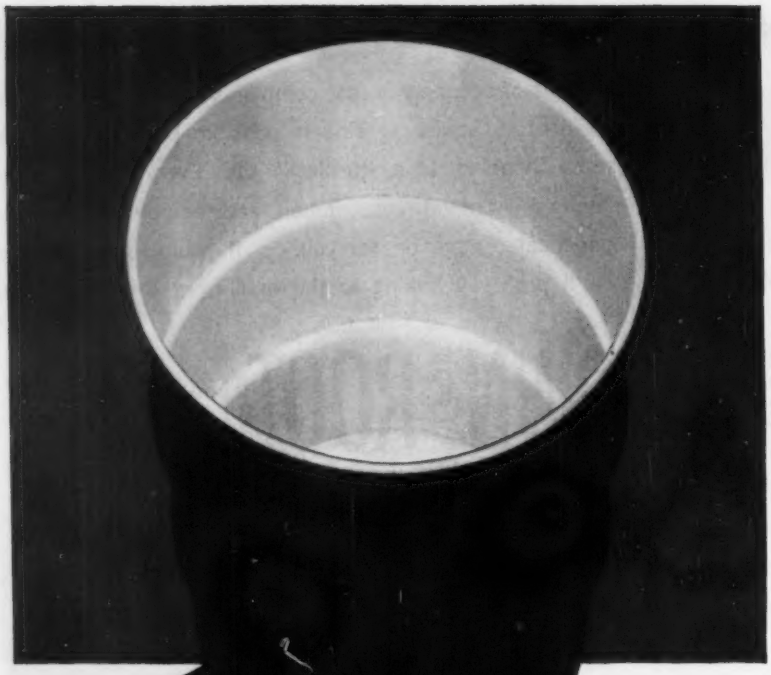

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crystal grains. This principle is used to harden some steels, where the precipitating carbon and alloys settle in hard grains between the crystals and add to strength through intercrystalline friction. In refractory metals, however, the basic metal is harder than carbon or most alloying metals; consequently, precipitating impurities have the reverse effect—they weaken structure.

• *Inert atmosphere*: Oxygen plays havoc with refractory metals, especially molybdenum and columbium and must be excluded whenever the metals are hot. The extreme measures that fabricators use to do this are emphasized by Universal Cyclops' Infab plant, a complete mill totally sealed in an argon atmosphere (*CW, May 6, p. 87*).

Heat or Extract: While the special fabricating techniques helped convince Du Pont that refractory metals were as much the business of a chemical process company as that of a metalworking firm, the full justification for its new plant was the company's new extraction process for columbium. Du Pont is keeping this process a secret, however, saying only that it uses an all-chemical route instead of conventional pyrolitic processes.

Normally, columbium is found as a rocky ore with only about 0.6% columbium content. The rock is crushed and the columbium concentration is then increased to 50-60% by flotation techniques. This concentration includes columbium oxide, which can be reduced by carbon or sodium at 1600-1800 F. Finally, the purified ore is reduced to a pure ingot through electron-beam melting.

In contrast, Du Pont's extractive process turns out a granular product that exceeds standard purity.

Although columbium is currently its main product the new Du Pont plant, has been designed to allow processing of titanium, molybdenum and tantalum also. The installation includes, besides the forge: a vacuum electric-arc furnace capable of producing ingots up to 8x40 in., a 2,500-ton extrusion press, and a one-stand multiple-purpose rolling mill capable of handling sheets up to 30 in. wide. Future of the refractory metals is still cloudy, but this unit shows that Du Pont at least is betting heavily that present markets will expand.

Eastman's custom processing service speeds marketing of new products for many companies

A number of producers of chemicals are now using Eastman's custom processing service to help shorten the time lag between development of new products and commercial scale manufacture. These companies point to several advantages that result from going outside their own organization to carry out certain organic chemical reactions. They avoid tying up capital in costly special-purpose or infrequently used equipment. They speed commercial production of new chemicals by eliminating process development and engineering design steps. They can use the custom processing service as additional production facilities when their own equipment is working at capacity. And they can take advantage of Eastman's specialized equipment and experience in handling certain unstable or hazardous reactants. Contracts can be drawn up for either one-time jobs or continuing, planned processing. If any of the reactions described here interest you, write for specific information, quantities and scheduling. Your inquiry will receive prompt attention.

Aromatic Reactions

Reductive Alkylation—of aromatic mono- or di-amines by condensing with ketones to form Schiff bases which are then reduced to the N-alkylated or N,N′-dialkylated aromatic amines. Aromatic nitro compounds are generally satisfactory as starting materials since they are reduced to amines under the reaction conditions.

Amination—of aromatic phenols (mono- or polyhydroxy) with aniline or other primary amines to give N-alkylated amines; for example, hydroquinone reacted with aniline gives 4-hydroxydiphenylamine.

Etherification of Phenols—with alkyl sulfates or halides to give mono- or polyethers, including compounds such as monomethyl, dimethyl, diethyl, dipropyl and dibutyl ethers of hydroquinone.

Reactions of Anthraquinone Derivatives—as for example the reaction of quinizarin (1,4-dihydroxyanthraquinone) with primary alkyl or aryl amines to give 1,4-bis(substituted amino)-anthraquinone.

Alkylation of Phenols—with alkenes or alcohols to give alkyl phenols including such compounds as 2,6-ditertiary-butyl-p-cresol, mono- or ditertiarybutyl hydroquinone, and mono- or ditertiaryoctyl hydroquinone.

The Fries Rearrangement—of esters of phenols to give compounds such as 2,5-dihydroxyacetophenone.

Nitration—of phenolic ethers, anilides and other aromatic compounds to give nitration in various positions. For example, the dimethyl ether of hydroquinone reacted with nitric acid gives the dimethyl ether of nitrohydroquinone.

Nitrosation—of amines or phenols to give nitroso compounds, as for example the reaction of dimethylaniline and nitrous acid to give p-nitrosodimethylaniline.

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Chemicals Division

Eastman

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Aliphatic Reactions

Acetylations—of alcohols or amines with acetic acid, acetic anhydride or ketene to give such compounds as esters, amides and anilides. Acetic anhydride and ketene are particularly useful with heat-sensitive compounds.

Aldol Type Condensations—with aldehydes, ketones, or both, to produce such compounds as acetaldol, butyraldol and 2,2-bis(hydroxymethyl)butyraldehyde (trimethylolpropane intermediate).

Anhydride Formation—of symmetrical or mixed anhydrides by reaction of acetic anhydride with various organic acids.

Dehydrations—of aldols and ketols catalytically or thermally to give such compounds as crotonaldehyde and isobutylidene acetone.

Dehydrogenations—of primary or secondary alcohols in liquid or vapor phase reactions to give, as examples: acetaldehyde, propionaldehyde, acetone, methyl ethyl ketone, and methyl hexyl ketone.

Esterifications—of saturated and unsaturated monohydric or polyhydric alcohols and monobasic or polybasic acids.

Hydrogenations—up to 2000 p.s.i.g. and 250°C. with various catalysts. Partial, selective hydrogenations of unsaturated aldehydes to saturated aldehydes such as 2-ethylhexenal to 2-ethylhexanal, and crotonaldehyde to butyraldehyde, have been carried out, along with experimental work on reducing the aldehyde group without hydrogenating the double bond, to give such compounds as allyl and crotyl alcohols. Complete reductions of aldehydes and unsaturated compounds have also been carried out to make butyl alcohol, 2-ethylhexanol, and isocaproic acid. Hydrogenations are also valuable in up-grading materials with undesirable unsaturation or color.

Oxidations—of saturated and unsaturated aldehydes, alcohols and aromatic compounds catalytically with air to give acids containing no inorganic products other than catalysts. Examples are the preparation of acetic, butyric, 2-ethylhexanoic, crotonic, benzoic, toluic and phthalic acids.

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New Route to Isoprene

Houdry Process Corp. has opened a new route to isoprene. Described last week at the Cleveland meeting of the American Institute of Chemical Engineers (CW Technology Newsletter, May 13, '61), this process is the fourth commercialized by monomers makers within the last two years.

Like the others (Shell's route, believed to be a two-step dehydrogenation from isopentane; Institute Francaise de Petrole's isobutylene-formaldehyde condensation; and Goodyear-Scientific Design's propylene dimer pyrolysis), Houdry's route starts in the oil refinery. It uses either isopentane or mixtures of isopentane and butane. Converting these in a one-step catalytic dehydrogenation, it is reported capable of turning out isoprene at 8-12¢/lb.

Key to the process is a fixed-bed catalytic reactor, which has already been used in commercial units producing over 250,000 tons/year of butadiene. The reactor can be directed to isoprene by switching the feed from butane to isopentane. Houdry says that a licensee has made a "very successful" plant test run on a combined isoprene-butadiene-butene operation. It reports estimated commercial yields based on pilot-plant runs with mixtures of isopentane, isopentene and butane.

While Houdry stresses the flexibility of its process, best yields were obtained with a 25% isopentane-75% butane feed, which produced both isoprene and butadiene with an over-all net isoprene yield of 58% by weight. Other runs showed that a 95% isopentane feed can be utilized to produce isoprene at an over-all yield of 49%; and the five-carbon fraction from gasoline produced by catalytic cracking gave an isoprene yield of 65% based on a fresh feed of 54% isopentane and 28% isopentene.

In the process, three reactors operate in parallel on acyclic basis to permit continuous flow during the three phases of dehydrogenation, switch-over, and regeneration. In the reactors, a cylindrical pellet form of chromia-alumina catalyst is mixed with an inert material of high heat capacity. This permits the heat liberated during the exothermic regeneration to be stored in the catalyst bed

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and then used by the dehydrogenation step. Temperatures are 1000-1150 F; liquid hourly space velocities are 1.5-3.5; and pressure is 22-24 in. of mercury.

Hot effluent from the reactors passes through a direct-contact oil quench and compression en route to a recovery section, which includes an absorber, stripper and debutanizer. Unreacted butane is recycled; and five-carbon components are sent to the isoprene purification section, which recovers isoprene (99%-plus pure), piperylene, and isopentene-isopentane for recycle.

Although the 8-12¢/lb. total manufacturing cost claimed for this process should make its product competitive with butadiene, natural rubber or isoprene from other processes, Houdry points out that its isoprene process is basically the same as its butadiene process. Should isoprene markets fail, such a plant could be used to produce butadiene and/or other mono-olefins or diolefins.

New Route to Ozone?

As part of an investigation done for the Army, the National Bureau of Standards has made tests on the production of ozone through gamma radiation. Its findings may open possibilities for a new route to ozone, which is currently finding new applications in the process industries (*CW, Jan. 28, '61, p. 27*). Chief purpose of the NBS test program was to find effects of diluents, needed because ozone can explode if its concentration increases beyond 24%.

Oxygen diluent mixtures were condensed into pre-evacuated sample tubes and irradiated with cobalt-60. Dilution with nitrogen had practically no effect on ozone production; dilution with moderate amounts of argon and krypton also failed to change the yield radically. During irradiation, energy was apparently absorbed by the diluent, which in turn transmitted this energy to the oxygen to a degree determined by the diluent. It was found that six moles of oxygen per 100 electron volts can be converted up to a stationary concentration of about 13% ozone.

Full details are available from the National Bureau of Standards' Office of Technical Information, Washington, D.C.

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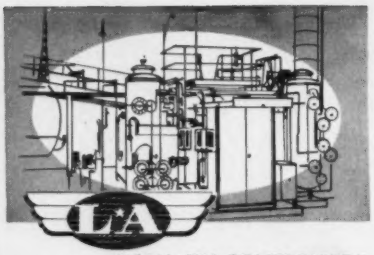

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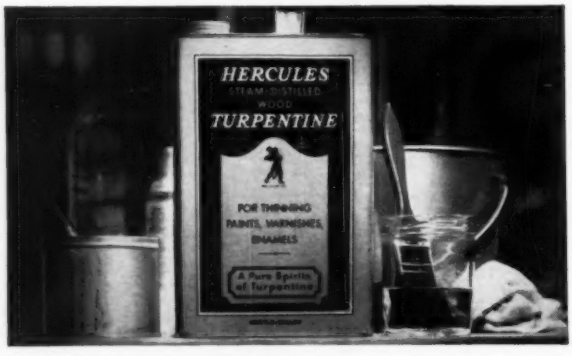

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CHEMICAL WEEK
May 20, 1961

Computer control of papermaking is moving closer to reality. IBM has teamed up with Potlatch Forests, Inc., to tie in an IBM 1710 process-control unit with a big papermaking machine at Potlatch's main plant in Lewiston, Ida. The operation will get under way in September. The machine, one of two at the plant, turns out 250 tons/day of specialized paperboard.

This could be important for the paper industry. The two companies foresee a number of advantages to precision control of the process. For instance, it will enable the operating crew to cut the time needed between runs of different grades of material. But the big payoff might well be a slash in the amount of off-grade paper produced, a constant headache for the papermakers.

IBM had previously revealed (*CW Technology Newsletter, Feb. 18*) that it was going to start up a pilot, computer-controlled papermaking process this month at its Research Center in Yorktown Heights, N. Y.

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There will be more information available on government research and development and it will be easier to get. This was the message John C. Green, director of the Office of Technical Services (U. S. Dept. of Commerce) had for the American Institute of Chemists meeting in Washington last week. He outlined three new programs aimed at achieving this:

(1) OTS will extend its work in conjunction with the Armed Services Technical Information Agency. ASTIA now provides reports for Defense Dept. agencies and their contractors; anyone else desiring copies must request them especially from OTS. In the future OTS will automatically get a copy of practically all unclassified reports, make them promptly available to the public. The July issue of "U.S. Government Research Reports" will reflect this increased volume. And in the future it will be published twice a month.

(2) A literature searching service is being set up in conjunction with the Science and Technology Division of the Library of Congress. "Tailor-made" literature searches will be done at a fee of $8/hour.

(3) A national network of regional depository libraries will be set up within a few months. Offices in 12 principal cities throughout the country will stock copies of current technical reports for the Defense Dept., Atomic Energy Commission, National Aeronautics & Space Administration and the National Science Foundation.

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Commercial quantities of two new acrylic monomers are now available from Rohm & Haas: dimethylaminoethyl methacrylate (DMAEMA) and tert-butylaminoethyl methacrylate (t-BAEMA). In copolymers, the functional amine group promotes adhesion and serves as an anchoring site for dyes and pigments. If the new products are used in

large enough quantities, the copolymers containing them are water soluble; in small amounts, they're acid soluble. By adjusting the molecular weights, copolymers exhibit either dispersing or flocculating properties. Also, the reactive amine group permits cross-linking as in the preparation of thermosetting acrylic coatings.

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Cheaper radioactive trace studies using relatively low-cost tritium is the promise from work done by Hilton A. Smith, chemistry professor at the University of Tennessee in Knoxville. At the recent International Atomic Energy Conference on Detection and Use of Tritium in Physical and Biological Sciences in Vienna, Austria, Smith detailed a method of separating tritium from hydrogen by use of gas chromatography. He suggests that tritium so made would cost $2/curie, could be used as a substitute for carbon-14—at $9,500/curie—in radioactive tracing.

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Further understanding of insects' resistance to DDT may now be possible as a result of work done at the University of California in Berkeley. A five-man team discovered an enzyme (present in the German and American cockroach and in several housefly strains) that oxidizes DDT to a harmless metabolite. This is the second such enzyme pinned down; an earlier one removes a hydrogen atom and a chlorine atom to render DDT ineffective.

The discovery helps fortify the theory that resistant strains of insects develop as a result of denaturing enzymes being passed genetically from one generation to another.

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Powdered aerosols are getting a big boost in Chicago this week. D. C. Geary and R. D. West of Union Carbide Chemicals revealed at the Chemical Specialties Manufacturers Assn. meeting that 10 years of work to package powders in aerosols is now paying off. Powders had presented three main problems: they tended to cake in the can; the valves clogged; and it had been impossible to load more than 15% solids by weight. A new valve has been developed to eliminate clogging; a new "lattice work" (a light-density siliceous material) holds the particles apart to prevent caking and permit solids loads of 25-30%. The new aerosols will use conventional fluorocarbon propellants.

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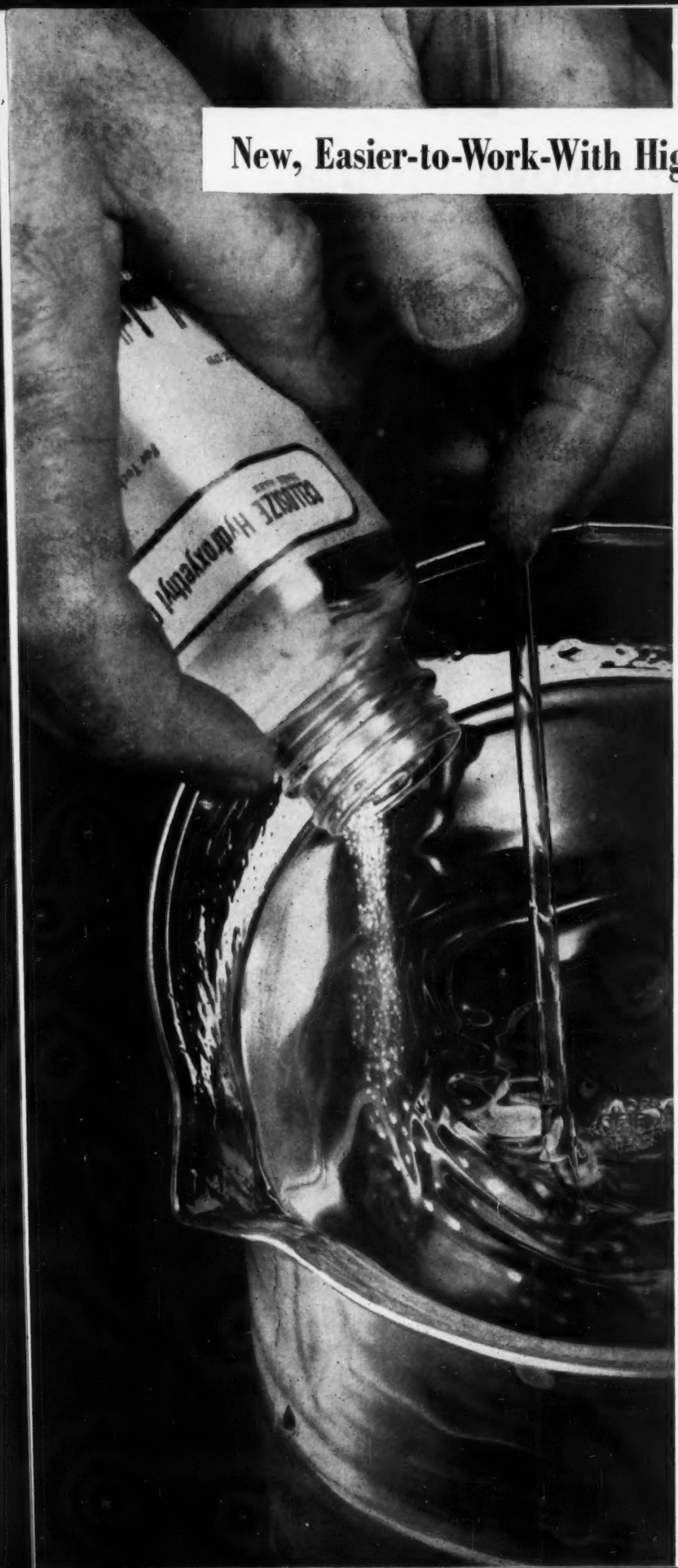
De Beers Consolidated Mines Ltd. will make synthetic diamonds. A subsidiary, Ultra High Pressure Units Ltd., has started plant construction and is expected to start up "early in the second half of this year." Products will be diamond grit for grinding wheels, presumably similar to the offerings of General Electric. It has been long known that the firm was developing a synthetic process. It reports, however, that though capacity will be considerable, the plant is being put up mainly as insurance against interruption of supplies from the Congo.



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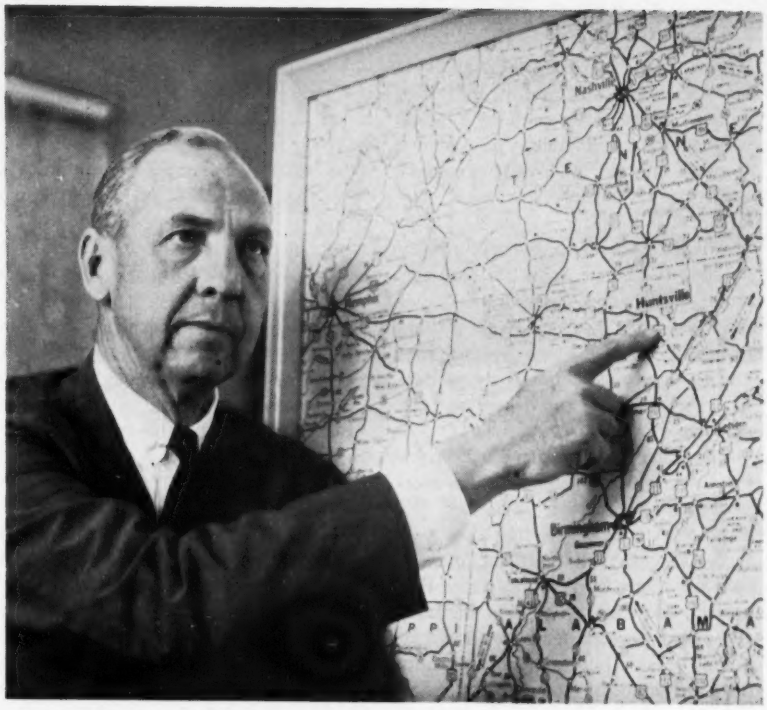

HIEC's Harry M. Rhett, Jr., helps attract chemical plants to Huntsville.

Dixie Beckons the CPI

Civic groups hold down taxes, land costs, labor problems, prepare for Alabama's industrial boom.

Linde's (division of Union Carbide) new Huntsville liquid oxygen-nitrogen plant, launched this week, reflects the active role that civic groups—in this instance, the Huntsville Industrial Expansion Committee (HIEC) — are playing in luring new industry to Alabama. Although the plant site was Linde's own choice, HIEC helped by keeping down land cost, and working toward favorable taxes and other concessions by the town and county (Madison) governments. And other CPI firms planning new plants can expect more enticements of this kind from the state.

HIEC's director and past president ('59-'60), Harry M. Rhett, Jr. (*picture, above*), says that the major reasons for Linde's move to Huntsville included: "proximity to the firm's customers, low power costs, and ample river water for cooling compressors." But he observes that HIEC arranged for Linde to buy necessary land "at an attractive figure," prevailed on the county to grade the land at no cost to the firm, and helped in selecting employees. (There are no industrial labor unions in the area.)

The new Linde plant is the largest of its kind in the South. The project cost an estimated $4-5 million, has a 140-tons/day capacity (both products). It will supply Redstone Arsenal, steel mills and chemical processors.

Alabama Bound: There are a number of groups in Alabama like HIEC whose purpose is to recruit industry to the state. Among them are the "Committee of One Hundred" (in both Montgomery and Birmingham) and North Alabama Associates (Decatur), which is headed by T. D. Johnson. These, coupled with formal state efforts (e.g., legislation) to promote industrial growth, are having a noticeable effect on Alabama's economy.

In the first two months of this year 17 new industries set up in 17 Alabama towns. These created 1,100 new jobs. And 600 other jobs were required as the result of 19 expansions in the same period.

A state growth record was set in the first nine months of '60. There were 131 expansions and 98 new plants—a total capital investment of $136,309,000—and creation of 10,772 new jobs. In all of '58 the new capital investment was only $49 million (compared with $101,846,000 in '59).

According to newly released government figures, growth of the chemical industry has been faster in the South than in other sections of the U.S. The East South Central region —Kentucky, Tennessee, Alabama and Mississippi — increased its over-all share of total U.S. chemical production from $292 million to $935 million (from 5% to 8%) during the period '47 to '57, the latest year for which Census Bureau data is available. (In the West South Central region — Texas, Louisiana, Oklahoma and Arkansas—the percentage jumped from 7 to 12.)

Profile: The HIEC group is well organized. Its membership consists of about 150 individuals, business establishments, and industrial firms. Individuals each pay dues of $100/-year. Additional funds come from the City of Huntsville Electric System and local industries, some of which HIEC helped attract to the city. Examples: Olin Mathieson Chemical's DDT plant and U.S. Industrial Chemicals' caustic and chlorine plant. Members include investors, insurance agencies, real estate firms, doctors, wholesale firms, department stores and other retail establishments, attorneys, contractors, building material suppliers, banks, loan associations.

Some of the money goes for salary and expenses of HIEC's executive director, Guy B. Nerren. Although HIEC is about 15 years old, Nerren (appointed in January) is its first full-time executive director. Wholesale grocer W. L. Halsey is HIEC president.

HIEC also recently spent an undisclosed sum for a survey of the Huntsville area by Fantus Area Research, Inc. (New York), to explore opportunities for new industry.

Among findings: "On the entire navigable length of the Tennessee

River there remains possibly not more than a handful of large sites with potential for development as heavy industry locations. Triana (near Huntsville) is one of these sites." Huntsville Industrial Sites, Inc., an offshoot of HIEC, recently acquired control of 120 acres of land extending three-quarters of a mile along the riverfront at Triana. Adds the Fantus report: "Other acquisitions are under active consideration. Ultimately more than 1,200 acres could be assembled, involving four ownerships and an average price of $250 per acre."

Fantus researchers also liked a 320-acre tract, called Site H, east of Huntsville on U.S. Route 72. Item: "The high rolling land is attractive, flood-free, and usable with a minimum of site preparation costs. The property is bisected by the right-of-way of the Southern Railway. It could be purchased for approximately $250 per acre." One suggested use: for a synthetic fiber plant.

Labor Picture: The report also notes that Huntsville is "free from intense competition for chemical industry workers, that the size of the labor force within Huntsville's immediate labor-drawing area is now more than 110,000, and that none of the local CPI plants—including Olin, USI, General Aniline & Film and Norton Co.—are unionized.

An HIEC survey showed these average hourly rates that are considered typical for the area: unskilled, $1.27; semiskilled, $1.42; skilled, $1.70; above-average skill (jobs requiring from six to 12 months' training), $1.92.

Halsey (left) and Norren head 150-man committee seeking new chemical plants.

Financing Tricks: The Alabama State Planning and Industrial Development Board (Montgomery) is ready with advice on financing new plants. A plant can be built with minimum outlay under either Alabama's Wallace or Cater Acts.

The Wallace Act authorizes municipalities to finance industrial projects "by the issuance of revenue bonds payable solely out of the revenues from the leasing of such properties and to secure such bonds by pledges of such revenues and leases and by mortgages on such properties."

The Cater Act is in some ways similar. Among the major differences between the laws: whereas the Wallace Act stipulates that bonds issued for a particular project must be paid off solely by revenues from that project, the Cater Act gives statutory authority to industrial development boards to issue bonds payable not only from revenue of the project being financed but also from revenues from other properties owned by the board.

In what was described as the largest single municipal borrowing of its type, a $25-million bond issue was recently marketed by the Alabama town of Cherokee (population 1,400) to finance construction of a fertilizer plant for lease to Armour & Co. Armour will pay off the principal and interest of the bonds via annual rentals (*CW Business Newsletter, May 6*).

Cloud on the Horizon: However, this form of financing may run into trouble. A proposal to discourage municipalities from issuing tax-exempt bonds to construct plants for immigrating industries was recently introduced in Congress (*CW Washington Newsletter, April 29*). Referred to the House Ways & Means Committee, it could become part of the bill that will be drawn up to incorporate President Kennedy's recommendations for tax incentives for business.

Rep. Robert P. Griffin (R., Mich.) charges that municipalities in some 15 states, largely in the South, are "abusing" the tax-exempt feature by issuing nonfederally taxable bonds to build plants, which, in turn, are used to lure industries away from other states. He has introduced a bill that would discourage this practice, which he calls "piracy," by no longer permitting rent paid for such plants to be a business expense deduction in figuring federal corporation taxes.

Griffin holds that issuance of tax-exempt municipal bonds for legitimate 'public or governmental purposes" is an acceptable practice. He has used the business deduction approach so as not to cast a cloud over bond issues.

Lots of Help: About 10,000 local organizations of all sizes in various parts of the country seek to attract industry. They may offer new sites or try to replace industry that has moved. Civic help is no substitute for a company's own judgment in site-seeking. But it can be a helpful extra.

New Syntex Venture

Syntex Corp.'s subsidiary, Syntex Laboratories, Inc. (New York), last week launched its first steroid drug to be sold under its own label in the U.S. The product, Anadrol (oxymetholone), is used in stimulating growth and building muscle tissue. Chemically, it's 2-hydroxymethylene-17α-methyl-17β-hydroxy-3-androstanone, a compound that is also sold by Parke, Davis.

Anadrol will be sold to wholesalers under a novel schedule that provides discounts from wholesale list price that are scaled inversely to unit price. This way, discounts are greater on less-expensive drugs, smaller on the higher-priced ones. Additional products are being readied, according to Syntex Labs President Edmund Beckwith, Jr. One likely candidate: a new synthetic steroid cream called fluocinolone acetonide (Synalar) claimed to be effective against chronic eczema and other skin diseases.

Safety First

Du Pont's 90,000 employees worked through the complete calendar month of April without a lost-time injury—a new event in the company's history. Employees turned in 14 million man-hours in more than 100 Du Pont locations throughout the country in setting the record. Last year Du Pont's frequency rate of lost-time injuries was 0.41 per million man-hours worked (compared with 3.32 for the chemical industry and 6.47 for all industry).

Among the important factors in Shell Chemical's decision to make polystyrene were its extensive background in polymers and its raw material position. Two other Shell thermoplastics followed quickly—polypropylene and polyethylene.

BULLETIN:

On May 3, 1960, a remarkable thermoplastics decision was made by Shell Chemical

Read about this Shell decision. And how you can start benefiting today from a major new source of polystyrene, polypropylene and polyethylene that resulted from it.

On MAY 3, 1960, Shell Chemical, a company long basic in styrene monomer and SBR rubber, decided to combine the two in full commercial production of Shell high impact polystyrene. Why was this remarkable?

A revealing fact on polystyrene

The condition of the polystyrene market was not attractive. There was oversupply from some of America's finest companies. The field was mature and Shell was starting late.

One revealing fact offset this situation. *Shell, with its excellent background in polymer chemistry—as exemplified by Shell Isoprene Rubber, the industry's first commercially produced synthetic/natural rubber—could make positive contributions to the thermoplastics field in the form of new products.* But Shell would be severely handicapped without a thorough understanding of how the thermoplastics market works and what it wants.

Result? Shell's decision to go full speed ahead with high quality general purpose, medium and high impact Shell polystyrenes, plus a rapidly expanding technical sales force.

80 million pounds of polypropylene

Two other thermoplastic developments followed quickly.

One, Shell's announcement in October, 1960, for an 80 million pounds a year polypropylene plant with customer service and research facilities to be built near Woodbury, N. J. Two, an arrangement by which Shell will resell limited quantities of polypropylene until this plant comes on stream.

Custom-made polyethylene

And this, in turn, led to a third important thermoplastic.

In order to round out a complete line of thermoplastics, Shell Chemical, in January, 1961, made arrangements to supply the industry with the highest quality custom-made polyethylenes.

How to start benefiting

Thus, within 8 months, Shell became an important factor in three plastics: Shell polystyrene, Shell polypropylene and Shell polyethylene.

The next 8 months should be even more important. Shell will be going full speed ahead searching for new polymers you want.

Now is the time to let Shell's technical representative know your needs. Tell him about them on his next visit or write Shell Chemical directly at:

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ADMINISTRATION

LABOR

ICWU Victory: Members of Local 45, International Chemical Workers Union, have turned down Allied Chemical and Alkali Workers of America as bargaining agent at the Pittsburgh Plate Glass plant in Natrium, W. Va. More than 500 workers are affected by the vote.

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Settlements: A strike that idled 2,000 employees at Food Machinery and Chemical Corp. (San Jose, Calif.) ended after members of Lodge 93, International Assn. of Machinists, accepted a company offer of a two-year contract providing wage increases on a graduated scale of 6-11¢/hour the first year and 6-10¢/hour the second year. Also included in the contract: more liberal vacation and insurance provisions, and some modifications of seniority procedure in event of layoffs.

• OCAW Local 3588 and edible oil producer Anderson, Clayton & Co. (Sherman, Tex.) have signed a two-year contract giving 250 workers pay raises averaging 9¢/hour this year and more than 5¢/hour in '62. The union sought an across-the-board 15¢/hour increase.

• A new wage agreement between United Rubber Workers and Goodyear Tire & Rubber Co. provides for increases ranging up to 14½¢/hour over the next two years for about 20,000 hourly rated employees in 11 rubber manufacturing plants. The agreement provides for a 7½¢/hour wage increase in all tire plants effective June 5. On the same date, a 3½¢/hour increase goes into effect in all non-tire plants covered by the agreement. On June 11, '62. an additional 7¢/hour increase for tire plant workers and 4¢/hour for non-tire plant employees will become effective.

KEY CHANGES

L. Patrick Moore to president; **Henry W. Bajak** and **Claude J. Kirkland** to vice-presidents, Arizona Chemical Co. (New York).

Harold E. Imes to president, Semet-Solvay Division of Allied Chemical Corp. (New York).

Elmer G. Smith to president, American Plastics Corp., a subsidiary of Heyden Newport Chemical Corp.

Burton F. Bowman to president Cyanamid of Canada Ltd. (Montreal, Que.).

William C. Buffing, Jr., to vice-president, National Starch and Chemical Corp. (New York).

T. M. Thompson to board chairman and chief executive officer; **Spencer D. Mosley** to president, General American Transportation Corp. (Chicago).

Thomas C. Jones to chairman of the board; **David G. Braithwaite** to president, Nalco Chemical Co. (Chicago.

N. Harvey Collisson to the board of directors, Olin Mathieson Chemical Corp. (New York).

John H. Long to vice-president and member of the executive committee, Hercules Powder Co. (Wilmington, Del.).

Albert W. Merck to the board of directors; **Fred Bartenstein, Jr.,** to administrative vice-president, Merck & Co., Inc. (Rahway, N.J.).

E. E. Ellies to president and chief executive officer of Tee-Pak, Inc. (Chicago), cellulose casing maker.

R. J. Kreiber to vice-president, Bzura Chemical Co. (Keysport, N.J.).

Ralph E. Bevis to vice-president, Ferro Corp. (Cleveland).

Alfred Guenther and **Johannes Wenghoefer** to vice-presidents, Hoechst Chemical Corp. (West Warwick, R.I.).

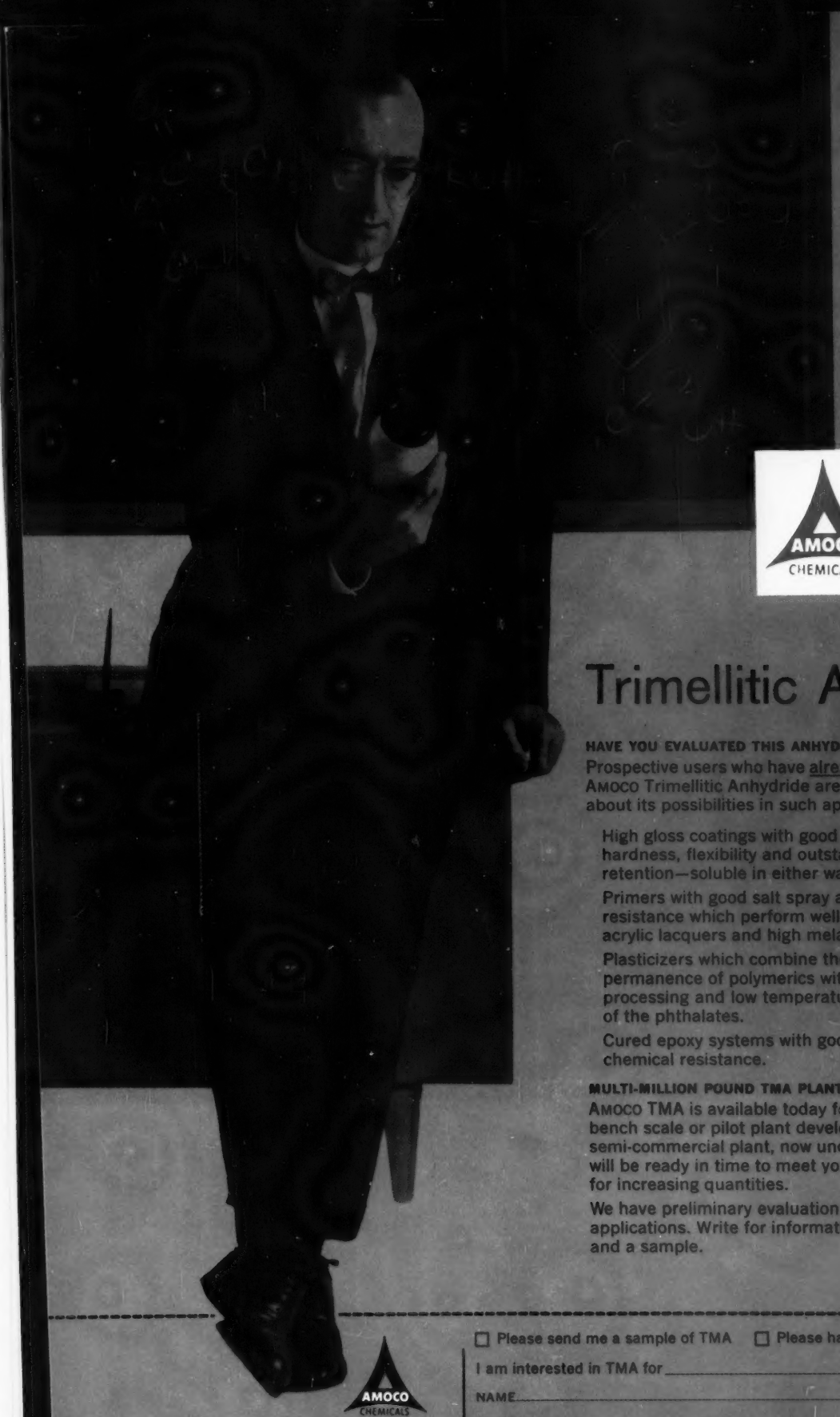
E. F. VanderStucken, Jr., to the board of directors, Texas Gulf Sulphfur Co. (Houston).

William B. Stillman to the board of directors, The Norwich Pharmacal Co. (Norwich, N.Y.).

William B. M. Tracy, Jr., to director of sales, Chemical Sales Division, Explosives Dept., E. I. du Pont de Nemours & Co., Inc.

Miles G. Beishline, Floyd M. Canter, Sid F. Davis, W. Boyd Owen and **Elliot R. Owens** to vice-presidents, Owens-Illinois Glass Co. (Toledo, O.).

Ralph E. Wise to the board of directors, The Lummus Co. (New York).



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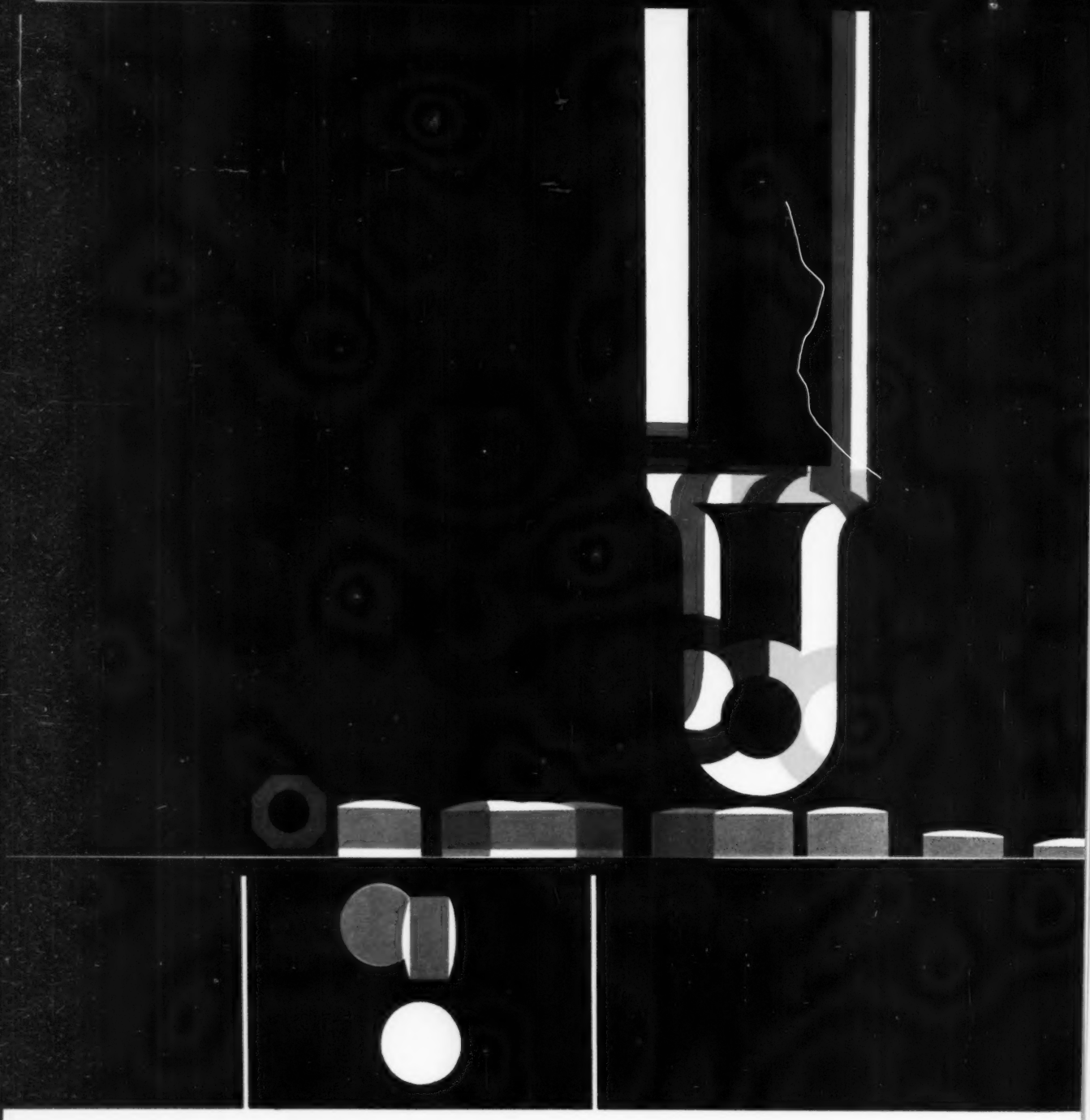

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Market Newsletter

CHEMICAL WEEK
May 20, 1961

The sudden 2-4¢/lb. slash in oxo alcohol prices initiated by Enjay Chemical late last week may be interpreted as a sharp move to block possible bargain-hunting by customers. But spelled out in even blunter terms (since other makers were quick to follow suit) it reflects a familiar chemical industry problem—overcapacity.

Oxo alcohols demand is generally estimated to be 160-170 million lbs./year—and capacity in place is more than ample to satisfy these needs. Mounting U. S. capacity for oxo chemicals (and much of it is alcohol) will aggravate the situation (*CW, March 11, p. 84*).

The changes in oxo alcohol tags, effective immediately on an f.o.b. supply point basis: hexyl, 17¢/lb. (off 2¢); iso-octyl, 18¢/lb. and decyl, 18¢/lb. (both down from 21¢/lb.); and tridecyl, 20¢/lb. vs. the former 24¢/lb.

Prices quoted are with minimum freight allowed to any destination east of the Rockies; add 1¢/lb. for shipments west of the Rockies.

Selling price on 2-ethylhexanol was adjusted by Union Carbide to match the new iso-octyl alcohol tabs. There had been a ¼¢/lb. differential between the two; both are now at the 18¢/lb. level.

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An extended line of phthalate and adipic esters are priced lower this week as a direct result of the softening in alcohol schedules. Union Carbide for example lopped 2-4¢/lb. off its Flexol plasticizers: di(2-ethylhexyl) phthalate, to 24½¢/lb.; didecyl and ethylhexyl decyl phthalates, to 25¢/lb.; butyl ethylhexyl phthalate, to 24¢/lb.; di(2-ethylhexyl) isophthalate, to 26¢/lb. Down 4¢/lb., to 36¢, are di(2-ethylhexyl) adipate and didecyl adipate. Tridecyl phthalate is reduced 3¢/lb., to 28¢. All are new tank-car prices.

Not all plasticizers are affected by this rash of price cuts, despite the growing competitive pressure. Prices of at least two, dimethyl and diethyl phthalates, will likely remain firm at the established 27¼¢/lb. level. Actually, these products do not generally compete with the octyl phthalates, and any change in their schedule would only be kicked off by a change in phthalic anhydride price.

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But what about phthalic? There's a great deal of speculation in the trade that the plasticizer and plastic raw material's price structure is weakening, that the present 20¢/lb. (c.l., bags) quote is in imminent danger of toppling. However, marketers say "not so."

Reasons cited for the bearish sentiment (bullish, if you're a consumer) center on (1) a "feeling" that the long-time pinch in phthalic supply is easing; (2) availability of new petroleum naphthalane from Ash-

Market Newsletter

(Continued)

land's 75-million-lbs./year plant (*CW Market Newsletter, March 4*); (3) Reichhold Chemicals' unpublicized move last month to bring its phthalic price (nominally 23¢/lb. since June '60) in line with established market levels.

Chances of a phthalic price break before the end of the year, however, appear slim. This despite the apparent validity of the above arguments.

For one, phthalic is still tight enough to warrant allocation to customers. It's known, of course, that present U.S. anhydride capacity is well over 500 million lbs./year, and by the end of next year this will be boosted to about 760 million lbs. (*CW Phthalic Anhydride Report, Dec. 10, '60, p. 85*).

But this, too, is fact: Coke-oven phthalic production will continue to be hobbled by lagging output of naphthalene from steel operations. And while imports of foreign naphthalene appear to have picked up slightly, much of the currently arriving material was booked as far back as October—and still commands a premium.

The anticipated fall-off of naphthalene imports—as demand for phthalic production abroad picks up—won't fully be made up until early '62, when new U.S. petro-naphthalene units (Collier-Tidewater's and Sun Oil's) begin supplementing output from Ashland.

Thus, unless there is a big gain in availability of phthalic feedstocks from coke ovens over the next few months (and this seems unlikely), price of phthalic anhydride will remain firmly pegged at present levels.

And despite Reichhold's retention of its higher phthalic tags the past several months, it's fairly well known in the trade that the company had precious little, if any, material for sale. Arrival of Ashland's petro-naphthalene feedstock, of course, changed that situation, brought about the realistic decision to realign phthalic schedules to match the market.

•

A new ethyl ether refining unit is now in operation at U.S. Industrial Chemicals' Tuscola, Ill., petrochemical complex. Material refined from the company's 3-million-gal./year ethyl ether plant is among the first to meet new specifications just adopted by the American Chemical Society.

•

More domestic vinyl resins on the way. Expansion of production units at Firestone Plastics' Exon plant (Pottstown, Pa.) has been completed. The enlarged layout (which includes 12 additional reactors) hikes the firm's resins and paint latexes capacity about 20%.

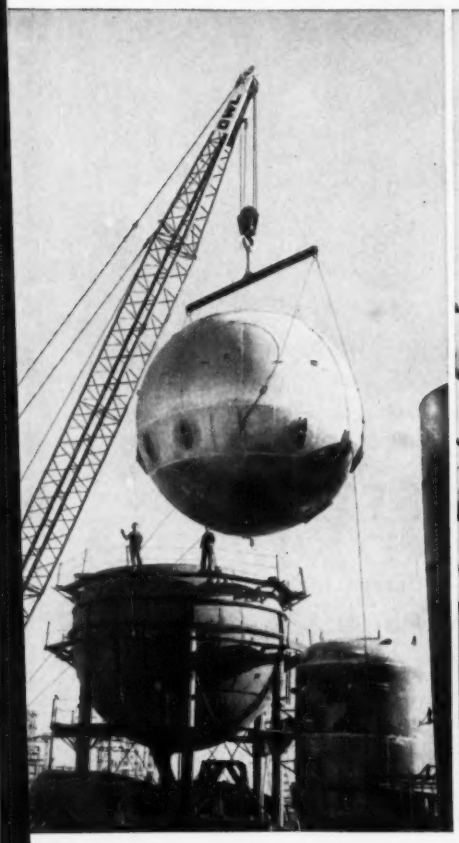
Although Firestone won't officially confirm capacity data, previous *CW* estimates indicate that the expansion increases the Pottstown PVC capability to slightly under 100 million lbs./year.

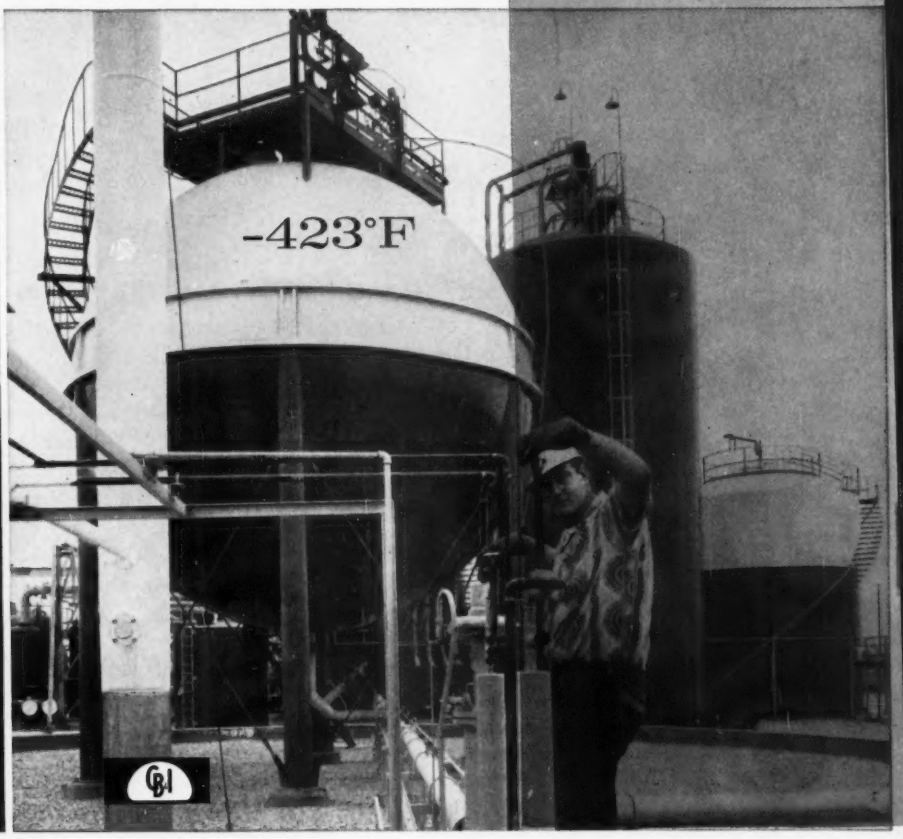
First privately owned and operated space-age plant
furnishes liquid hydrogen
to missile centers
and industrial users

NITROGEN

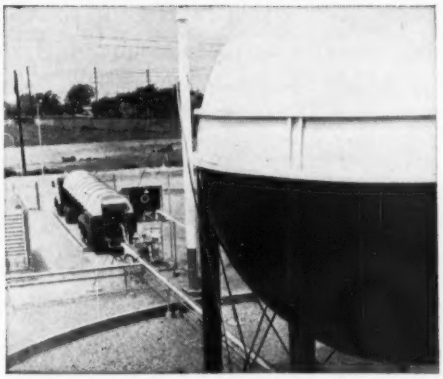
HYDROGEN

-320°F





These double-wall cryogenic storage tanks play a vital role in the first privately-owned plant to supply liquid hydrogen on a large-scale commercial basis. Hydrogen is stored in the sphere at –423°F and nitrogen in the cylindrical tank at –320°F. Located in Torrance, Calif. and owned by Linde Company, Division of Union Carbide Corporation, the plant will deliver 3,300,000 lbs. of liquid hydrogen yearly to missile centers. Both tanks were designed (using Linde-approved designs), fabricated and erected by CB&I, world's most experienced builder of cryogenic vessels.



ABOVE: Aluminum inner shells and carbon steel outer shells were used for the two cryogenic tanks. The spherical tank is 28 ft. in diameter and the cylindrical tank 21½ ft. Special insulation is between the shells.

TOP LEFT: The inner sphere is suspended in the outer sphere by stainless steel rods positioned around the perimeter. Resting on the ground nearby is the aluminum inner shell of the cylindrical nitrogen tank.

LEFT: A trailer is being loaded with liquid hydrogen for delivery to missile centers, other government installations, or industry.

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Treasury Secretary Dillon wants to draw profits back to U.S. by establishing 'equity' between producers.

WIDE WORLD PHOTO

Congressman Byrnes favors allowing U.S. companies to compete abroad on equal footing with foreign firms.

Ahead: Tax Bite on Foreign Business

U.S. chemical firms with stake abroad bide their time until the fate of Administration tax proposals is resolved.

The hottest topic of conversation among the CPI's "international men" is the Kennedy Administration's proposals on taxing income from foreign business.

The proposed changes include: elimination of tax deferral privileges in all but specified undeveloped countries and "tax haven" deferral privileges in all countries; boosting U.S. taxes by changing foreign tax credit rules; and elimination of the tax exemption enjoyed by U.S. citizens living in developed countries. The changes were presented in the President's April tax message (*CW, April 29, p. 24*), and were spelled out in greater detail earlier this month by Treasury Secretary Douglas Dillon. Starting June 5 the House Ways and Means Committee will hold a full week's hearings on them.

What effect would the proposals have if they became law? No one is sure. But everyone agrees the impact would be of considerable importance. CPI executives, along with most businessmen, agree it would be harmful to their own business and to the country.

One large accounting firm advises its staff: "The economic effect on and dislocation of foreign operations as a result of these proposals would obviously be severe, since there would be a reduction of as much as 50% in capital available from foreign earnings for expansion and new ventures. Management arrangements entered into solely on the basis of business purpose would have to be reconsidered. . . . "

Even though they are a long way from becoming law, the proposals are already affecting the overseas plans of U.S. chemical companies. Allied Chemical, for example, has reportedly been planning to reinforce its overseas operations by setting up a European holding company to accumulate funds for further expansion. Company spokesmen say they have no statement to make at this time because the firm is still studying the effect the Kennedy tax change would have on its operations.

Stauffer had been considering channeling its exports through its Swiss financing subsidiary, but dropped the plan partly as a result of the Administration's attitude towards foreign investment. And the plans of other chemical companies already established overseas or in the process of setting up international operations have been suspended.

Pulling Profits Home: The Administration says its foreign tax proposals are based on the belief that the present tax laws favor foreign over domestic investment, that this is no longer desirable or necessary in the case of investments in economically advanced

countries, and that elimination of "preferential" tax treatment would help right the balance of payments and spur domestic investments.

The most important change deals with the present law under which a U.S. company operating overseas through a subsidiary may defer payment of U.S. taxes on its share of the subsidiary's profits until it receives them as dividends.

Under the new proposal, the company would have to pay the U.S. tax (minus the foreign tax credit) on its share of the subsidiary's full profits each year, whether or not they were distributed. To allow the company time to adjust to the new conditions, only half of the undistributed profits would be taxed during the first year, except in the case of "tax haven corporations."

This rule would apply to a foreign subsidiary in which 10 or fewer U.S. shareholders owned more than 50% of its stock (directly or indirectly) at the time the law is passed. Thus, a company with a majority share in a foreign subsidiary could still keep the deferral privilege by cutting down its share to 50% or less before the law is passed.

In the case of subsidiaries set up after the law is passed, the no-deferral rule would apply to shareholders with a 10% or greater interest, whether or not the test of U.S. control is met.

To help promote investments in underdeveloped countries, the deferral privilege would be continued in countries, as such, except for "tax haven corporations." The final list of "underdeveloped countries" has not been drawn up, but the recommendation excludes all European countries except Greece. Canada, Japan, Australia, the Bahamas, Hong Kong, the Union of South Africa, Bermuda, Iceland, Netherlands Antilles and San Marino are also excluded.

A "tax haven corporation" is defined as any corporation which derives more than 20% of its income from sources outside the country in which it was created. Income from outside sources would include profits on sales outside the country of goods not made by the corporation, commissions on sale of goods for markets outside the country, interest and dividends from corporations organized under the laws of another country, fees for services rendered outside the country, etc. The source test would be more flexible for manufacturing corporations in underdeveloped regions.

The proposed change in the method of crediting foreign taxes against the U.S. tax would apply the U.S. tax, less credit, to the pre-foreign-tax profit, instead of the after-tax profit. This would result in a combined U.S. and foreign income tax of 52% on the U.S. parent's share of the subsidiary's gross profits. Under the present law, total income taxes could be as low as 45%.

This provision is milder than the parallel provision in the bill spon-

Two ways to show foreign investment's effect on U.S. capital outflow:

1—WEIGHING CAPITOL OUTFLOW AGAINST REMITTED INCOME

Net capital flow to U.S. (million dollars)

	From All Direct-Investment Enterprises				*From Manufacturing Subsidiaries Only*	*From All Subsidiaries*
	1957	*1598*	*1959**	*1957-59*	*1957-59*	*1957-59*
All areas	**—233**	**+959**	**+789**	**+1,515**	**+121**	**—98**
Canada	**—383**	**—106**	**—64**	**—553**	**+104**	**—272**
Latin America	**—283**	**+342**	**+262**	**+321**	**—117**	**—185**
Western Europe	**—6**	**+149**	**—23**	**+120**	**+65**	**+47**

* Preliminary. Sources: Survey of Current Business, Dept. of Commerce; Office of the Secy. of the Treasury.

2—WEIGHING OVER-ALL TRANSACTIONS OF DIRECT INVESTMENT ENTERPRISES WITH U.S.

	All Industries, 1957 (millions dollars)				*Manufacturing Industries*
	All Areas	*Canada*	*Latin America*	*Western Europe*	*All Areas*
Exports to U.S.	**3,770**	**1,363**	**1,563**	**195**	**1,093**
Capital from U.S.	**2,482**	**718**	**1,163**	**287**	**432**
Total outflow	**6,252**	**2,081**	**2,726**	**482**	**1,525**
Imports from U.S.					
Capital equipment	**657**	**47**	**360**	**43**	**94**
Other imports	**1,972**	**845**	**444**	**397**	**1,112**
Remittances					
Fees and royalties	**241**	**60**	**70**	**58**	**117**
Income	**2,249**	**335**	**880**	**281**	**429**
Total inflow	**5,119**	**1,287**	**1,754**	**779**	**1,752**
Net flow	**—1,133**	**—749**	**—972**	**+297**	**+227**

Source: U.S. Business Investments in Foreign Countries, Dept. of Commerce.

sored by Senator Albert Gore, which would treat foreign taxes as a deduction, not a credit (*chart, p. 82*).

The Administration also proposes to eliminate completely the foreign tax credit now allowed on royalty income from a company's wholly owned subsidiaries.

Numbers Game: Most of the arguments for or against the Administration's foreign tax proposals center on the role of foreign investment in the balance of payments question. The issue has been confused by the lack of statistical evidence and the arbitrary use of available figures (*tables, p. 80*).

Opponents of restrictions on foreign investment balance the outflow of U.S. capital into direct foreign investments against remitted income from such investments, and conclude that foreign investment helps the balance of payments. They cite evidence that this inflow exceeded outflow during each of the past 10 years every year except 1957, making a total net inflow of some $9 billion.

On the other hand, in his explanation of the new tax proposals to the House Ways and Means Committee, Dillon produced evidence that foreign investment has been a "significant factor" in the balance of payments deficit. He noted that during the four years 1957-'60, U.S. capital outflow to Western European subsidiaries amounted to $1.7 billion, while only $1.3 billion was remitted as dividends, leaving a net outflow of $400 million.

In Canada, by the very same measurements, the net outflow was $200 million. Dillon did not include figures for branch operations, since they do not enjoy tax deferral and thus are irrelevant to the deferral issue.

Data Gaps: Actually, neither set of figures is conclusive. For one thing, they lump manufacturing enterprises with such activities as mining and petroleum, even though the economic role of trade patterns and the over-all balance of payments impact of these industries differ greatly.

Moreover, they do not include royalties and other fees which foreign investment proponents say are a relevant and important plus factor. But most important of all is the lack of information about trade of these foreign investment enterprises with the U.S. A Commerce Dept. study for 1957 gives the only data on the subject. It shows that exports to the U.S. from foreign investment enterprises of all industries exceeded their imports from the U.S., contributing to the balance of payments deficit. For manufacturing enterprises alone, however, the net flow was in favor of the U.S. (The figures for imports from the U.S. and royalties are understated.)

Even if the trade data were complete, it would not provide a reliable measure of the real trade displacement effect of investment. There remain such unmeasurable factors as the results of the shifts between and development of new productive resources, the impact on economic activity, the strength of incentives to export and import which would exist in the absence of investment, etc.

Evidence on Exports: Some proponents of foreign investment note that the volume of U.S. exports to any foreign country is proportional to U.S. capital outlays in that country, suggesting a causal relationship. This is hardly proof of any such relationship, since countries with the biggest economies trade the most and could be expected to draw the most investment.

In support of foreign investment, chemical companies point out that exports have kept climbing along with investments. But the question remains: "Might not exports have grown even faster if there had been fewer investments?"

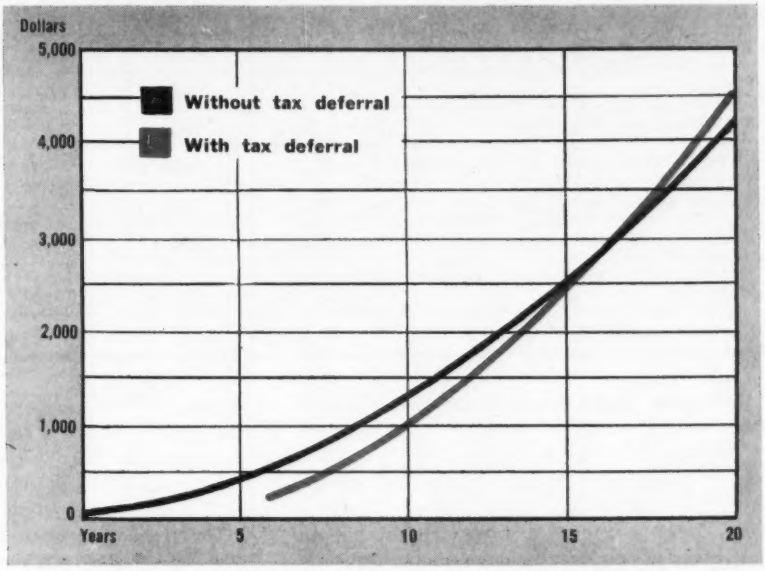
Many chemical companies say they will export to a market as long as they can, build a plant abroad only when they face loss of the export market through import restrictions, local competition, etc.

Merck, for example, says it is building a plant in Lima because the Peruvian government has barred imports of finished pharmaceuticals. This move will keep Merck in the market and open the way for exports of intermediates. This repeats an old pattern. Merck has shipped its Dutch plant $19.5 million in intermediates and bulks, sends its plant in England about $100,000/year in materials, has shipped about $11.2 million in products to its Brazil plant and $4.6 million worth to its Japan plant.

New York consultant Stefan Rundt, warning that the tax proposals would have a deadly effect on the balance of payments, cites the case of a petrochemical plant built in France by a U.S. company. It financed the $10-million plant through its Canadian holding company. This halved the cost. The plant took $2 million in capital equipment from the U.S. and

How Tax Deferral Can Cut Profit Flow-Back

Cumulative Remittances to U.S. from Net Earnings of Foreign Subsidiary*



* Assumptions: Initial investment of $1,000; 20% annual rate of earnings before taxes; foreign tax rate 20%; U.S. tax rate 50%. Reinvestment of all after-tax earnings for first five years, and reinvestment of half of after-tax earnings for next 15 years.

Proposed Changes in Tax on Foreign Dividends

	Present Law	*Administration Proposal*	*Gore Bill*
Profits of foreign subsidiary	**$100**	**$100**	**$100**
Foreign tax	**30**	**30**	**30**
Dividend to U.S. parent	**70**	**70**	**70**
Plus "gross-up" of foreign tax	**—**	**30**	**—**
Tentative U.S. tax at 52%	**36.40**	**52**	**36.40**
Credit for foreign tax paid by subsidiary	**21.00**	**30**	**—**
Net U.S. tax	**15.40**	**22**	**36.40**
Combined U.S. and foreign tax	**45.40**	**52**	**66.40**

$30 million in raw materials the first year of operation.

Experts differ on the subject, but the prevailing view is that while foreign investment may at first increase U.S. exports, it tends in time to replace them. To the argument that investment helps exports by stimulating economic growth, they reply that you can't consistently take that position while at the same time arguing that if U.S. companies don't build plants, foreign interests will.

Some government experts believe that many of the stories about the necessity of investing in order to penetrate a market merely mask and encourage a failure to sell U.S. goods hard enough. (And it has been noted that foreign operations are often more profitable than domestic ones.) They fear that by rushing in to build abroad U.S. companies will be giving away the fruits of U.S. research and capital investment—one of our few remaining competitive advantages in world trade.

Killing the Goose? While it is concerned with these considerations, the Administration's chief objective of trying to end tax deferral in developed countries is more immediate. Dillon estimates "very roughly" that it would improve the U.S. balance of payments position by as much as $390 million/year.

The tax deferral privilege, along with the laws of tax haven countries like Switzerland, have enabled U.S. companies to store up funds abroad, trim their foreign tax liability and defer or avoid altogether U.S. taxes on their sales of foreign produced goods and on a substantial part of the value of their exports. In effect, these firms receive an interest-free loan from the government, the Administration feels.

Businessmen argue that their ultimate aim is to bring home profits, that accumulating bigger investment funds now will mean greater profits—and U.S. revenues — later. Dillon agrees, but he points out that this would likely mean a long delay (*charts p. 81*), while the balance of payments problem is immediate. The question, officials say, is not the net balance of payments effect of total cumulative investment overseas, but the effect of new investments over a short period of time. It is imperative, Dillon says, that we avoid another balance of payments crisis.

Business spokesmen charge that this is a short-sighted policy that will eventually hurt our international position.

Rundt asserts that the problem is not the outflow of funds, but the lack of incentive to bring them home. He proposes a short-term tax holiday or "a super Boggs bill."

If the deferral privilege is withdrawn, companies with plants in low-tax countries or which have been using tax haven setups will feel the greatest jolt. The change would make least difference to companies operating in high tax countries like the U.K. and Germany, and which don't use tax havens, since they would be subject to little or no U.S. tax anyway.

Reactions to the proposed changes range from the contention that they would mean cutting back foreign operations, to the remark of one big-company executive: "We'll squawk about it, of course, but if it comes we'll live with it."

Chemical executives and international tax experts are quick to charge that the proposals would put U.S. companies at a competitive disadvantage in foreign markets. In low-tax countries, U.S. companies would pay a higher total tax than local competitors. And since the U.S. would be the only country taxing income earned abroad prior to remittance of dividends, U.S. companies would be at a disadvantage with "third country" producers. This would be especially true with competitors from countries like France, Canada, Italy, Switzerland, and Holland, which virtually exempt foreign subsidiary dividends from taxes.

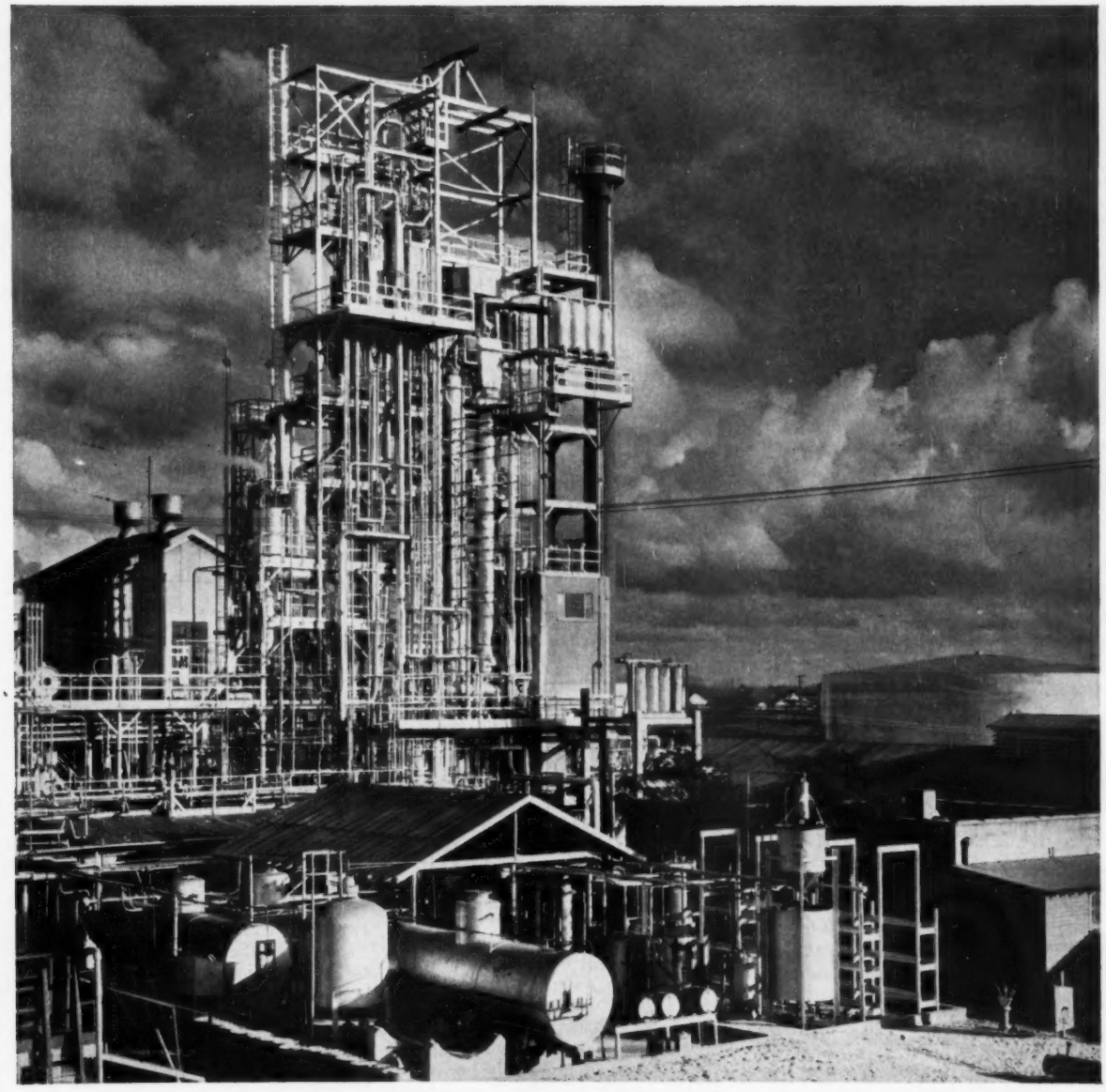
Dillon poses the problem as making a choice between equity with foreign producers or equity with domestic producers. He comes down for equity at home, but believes truly competitive companies will survive abroad. But U.S. companies complain that the proposed tax changes would give them less than equity in both areas, since besides paying 52% in income taxes, they are burdened with many heavy foreign taxes which are not credited.

The Administration hopes that by maintaining the tax deferral privilege in underdeveloped countries and eliminating it in the developed countries, it will increase the relative attractiveness of the former.

But industry men assert that they will be less likely to take the risks of investing in underdeveloped countries if they have to do it with profits depleted by the full 52% tax.

Dim Outlook: As the House committee hearings on the tax bill got under way, criticism of many aspects of the Administration program was leveled at Dillon by Democrats and Republicans. A leading committee Republican, Rep. John Byrnes (Wis.), probably voiced the feelings of many committee members in a speech to the House in which he said he wanted U.S. companies to compete abroad under "no less favorable ground rules" than those applying to foreign companies, that the Administration program would hurt—not help—the balance of payments.

Outlook for passage of the Kennedy tax measure this year seems dim. And most experts won't speculate on what Congress might pass if it takes apart the Kennedy package and assembles its own.



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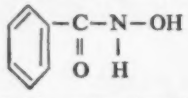
The basking sharks are in again

A place where guided missiles are tested phoned us recently. They wanted to know about *Squalane* (Eastman 7311), the hydrogenated form of *Squalene* (Eastman 6966), a branched, polyunsaturated hydrocarbon derived from the liver of the basking shark. Some years ago we had mentioned in an advertisement that not only biochemists and oil chemists but also dogs found one or the other of these two compounds interesting. The man at the missile place wanted to know if there was anything in our squalane that would be harmful when painted on the missiles before firing so as to guide the trained dogs they send out sniffing over the impact area to bring back the fragments for examination. We reviewed our squalane specifications with him. Since our squalane is principally used as a stationary-phase liquid in gas chromatography, our standards have to be pretty high. They satisfied him, and they certainly ought to satisfy *anybody* who smears squalane on his missiles to guide dogs.

That new calcium reagent? Sure!

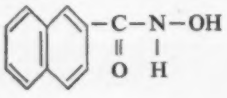
The following proves that we are human. Frankly, we would much prefer to be regarded as a benevolent but flawless machine, incapable of error. It looks nicer.

But since you insist on reading on into the details, consider *Benzohydroxamic Acid* (Eastman 8262), a reagent of broad analytical utility. This compound forms a brilliant red color on chelation with ferric chloride, colorless salts with the alkali metals, and colored chelates with many polyvalent metals such as uranium and vanadium. Its structural formula is



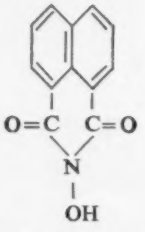
and it had held our attention. At this time our attention was also drawn to a preconvention abstract of an analytical paper on a new reagent for traces of calcium in steel and sodium. The calcium reagent was designated naphthalhydroxamic acid.

This, we mumbled to ourselves, figures — a homolog—



So we made it. The paper was duly presented at Pittsburgh by a representative of the chemical company where naphthalhydroxamic acid had proved useful. Recognizing our cherished role as intermediary between laboratories where a reagent is discovered and laboratories which want to try it, a chemist from another chemical company immediately made inquiry to us. We showed him our new homolog. He ordered some, went home, tried it, and found it worthless for the purpose. You, of course, realize why.

Our homolog is *1-Naphthohydroxamic Acid* and was so labeled. But who brought up the homolog jazz anyway? We did. The man who had said naphthalhydroxamic acid wasn't suffering from a speech defect or a typographical error. It was we who were suffering from the disease that causes jumping at conclusions. He meant the reaction product of hydroxylamine with naphth*al*ic anhydride, viz.



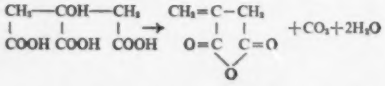
Abashed, we slunk back to the bench and made that. Another goof here would be most unbecoming. The man who called it naphthalhydroxamic acid had said it was white. What color was ours? Yellow. Yellow, eh? Stall! Don't ship! Give any excuse, but don't ship! And we dug into the literature. Even dug up an old paper that speculated about what it called "xanthoisomers" of certain phthalic oximes otherwise structurally identical.

Our product *did* give the proper infrared absorption spectrum and melting point. It *did* give an excellent test for Ca^{++} when used in a procedure in *The Analyst* (Dec. '60), where the compound permits determination of calcium for 0.2 ml of serum as compared to the 2.0 ml required for accuracy by the standard oxalate method. This paper described the compound as yellow. A Japanese paper was also found that described it as yellow.

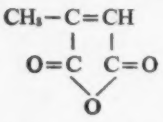
Confidence slowly returned. Under the name *N-Hydroxynaphthalimide* and the designation Eastman 8161, we are now releasing it and even offering procedural abstracts. Also offered is the ill-begotten *1-Naphthohydroxamic Acid* as Eastman 8030. It may be good for something.

We are justifiable

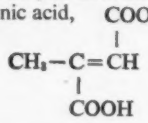
If you put some citric acid in a flask and heat it to 500°C, itaconic anhydride distills over.



If you happen to want some itaconic anhydride, this method will exasperate you. The itaconic anhydride keeps rearranging into citraconic anhydride,



If you redistill the crude mixture, you wind up with good quality citraconic anhydride but no itaconic anhydride. You can treat the citraconic anhydride with 25% nitric acid, which restores a molecule of water, but now you have the *trans* form called mesaconic acid,



Still no itaconic anhydride.

At this point you order *Itaconic Anhydride* from us as Eastman 8291. We have a chemist who found out what changes to make in the published method for changing commercial itaconic acid to itaconic anhydride so that it would work. You owe him no salary for the time he was finding this out. Nor are you responsible for his professional and intellectual development. All you want is a little itaconic anhydride. Why do you want it? Goodness knows. Goodness knows why *most* of the compounds in our catalog are wanted. But, boy, are they wanted! Business has never been better. Drives us frantic.

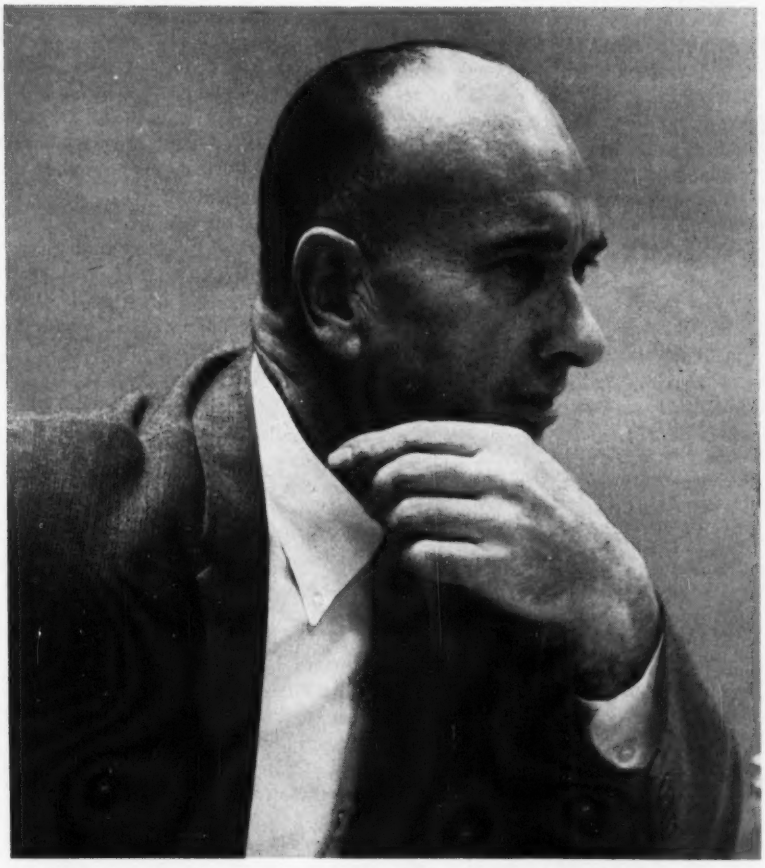
You can't do your part unless you have a copy of "Eastman Organic Chemicals, List No. 42." It comes from *Distillation Products Industries*, Eastman Organic Chemicals Department, Rochester 3, N. Y. Many laboratory supply dealers, along with us, stock the chemicals.

DPi

Eastman Organic Chemicals

Also...vitamins A and E in bulk...distilled monoglycerides

Distillation Products Industries *is a division of* **Eastman Kodak Company**



USI's McCarthy: Strong for specialization in sales literature.

More 'Sell' in Sales Books

There's new pressure to keep sales literature effective, up to date and aimed at specific markets.

Technical literature — considered the most effective chemical sales aid by some chemical process plant managers*—is steadily getting more emphasis from chemical marketers. But producing these sales tools is becoming increasingly difficult; advertising and sales promotion men are faced with these three major problems in this area: (1) rapid obsolescence, (2) need for more specific treatment of customer problems, (3) lack of adequate literature in foreign languages to support and strengthen rising overseas chemical sales.

* Two McGraw-Hill surveys on effectiveness of sales aids, by Laboratory of Advertising Performance and *Chemical Engineering*, support this.

These are the highlights of a just-completed CHEMICAL WEEK survey of chemical advertising and sales promotion managers concerning their literature programs. Although there is still substantial disagreement among these men over which element in the marketing process is most vital, virtually none of them denies the importance of sales literature in bridging the gap between an initial inquiry and a sales call.

Laurence L. Shailer, manager of trade advertising and sales promotion for B. F. Goodrich Chemical Co., sums it up this way: "Good literature is probably the foundation for everything else."

Chemical companies' average expenditure for sales literature — booklets, brochures, reprints, data sheets —is about 10-15% of their total promotional budgets. Some firms spend 25-30% for literature, and a handful allocate 40-45% of all promotional funds for such uses. For all companies it is a significant item.

Improving the Aim: A frequent comment from advertising and promotion people concern the need to tailor their literature to specific customer needs. Although some do it now, most feel that more should be done to supply customers with specialized information.

Behind this need: the steadily increasing market specialization that currently characterizes the sales and distribution efforts *(CW, May 6, p. 65)* of many companies in the chemical process industries.

An example of this specialization is U.S. Industrial Chemicals Co.'s booklet on polyethylene film extrusion. This booklet, now being distributed to USI customers, is more than simply a descriptive book or data reference source; rather it's a training manual for extruder operators and maintenance men.

The booklet is devised to aid the shop manager or owner in teaching his new employees, practically all of whom lack technical backgrounds or even basic knowledge of plastics or heir processing.

Says USI's Plastics Sales Director Vincent McCarthy: "Our literature program has been very important to our sales effort in the past, and we expect this new manual to increase our share of the business with many accounts."

Keeping It Fresh: Another problem getting a lot of attention is literature obsolescence. Nearly every CPI firm participating in *CW*'s survey notes this as a serious problem—and one that's getting worse. Company changes (merger, acquisition), more rapid technological progress and stiffer competition all shorten the effective life span of sales literature.

What are they doing about it? Some companies are now revising virtually all their literature; some are making major changes when literature stocks are depleted and additional printings are needed; others are

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Find out for yourself how a Gaulin Homogenizer or Colloid Mill can improve your product and lower processing costs. You can rent one for only a few dollars a day.

Gaulin Laboratory Homogenizers — maximum capacity — 15 gph; minimum processable sample — 1 pint; pressure to 8,000 psi continuous; 10,000 psi intermittent.

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Remember, the rental cost is applicable against the purchase price of the machines. Write for Laboratory Homogenizer Bulletin LH-55; RE Colloid Mill Bulletin — C-57.

Gaulin

MANTON

Gaulin

MANUFACTURING CO., INC.

72 Garden St., Everett 49, Mass.

World's largest manufacturer of stainless steel reciprocating pumps, pressure exchange pumps, dispersers, homogenizers and colloid mills.

going heavily into so-called modular forms of booklets—loose-leaf types—to allow easier updating.

Many companies distribute extensive literature when each new product is introduced, then rewrite or revise it within six to nine months when additional field or laboratory data are available.

Going Abroad: Despite these problems, most advertising managers feel technical literature problems in the U.S. are not nearly so pressing as those abroad.

Some chemical processors are well on their way to backing up their global marketing efforts with advertising and sales literature in appropriate languages. Abbott Laboratories (Chicago) publishes its material in 19 languages. While this is not now typical in the CPI—in fact, most companies have translated very little of their sales material into foreign languages—there's keen interest in the value of translations.

The solution is not simply one of having U.S. sales literature translated; in addition, the material must be presented in the vernacular of the foreign reader. New terms, strange-sounding English descriptions (such as a "fisheye" in plastic film) must be put across clearly and unambiguously in the translations. Small budgets and scarcity of personnel have kept this effort to a minimum. But now there's pressure to change this.

New Directions: Most advertising managers point out that sales literature is becoming much more attractive, as companies show more professional use of art, color and typography.

Louis Neibauer, vice-president of Edward Stern & Co., an Eastern printing house (New York, Philadelphia, Pittsburgh), which does much of the literature for CPI companies, says that purchasing executives and comptrollers are demanding justification for the added costs of making sales literature more appealing. Nonetheless, he reports, the spending for these so-called frills actually increases when a company is convinced that the extra cost might boost sales.

While the ad and sales promotion managers, despite their problems, indicate that CPI sales literature is more effective today than ever before, they apparently count on getting still more value from this sales tool.

Cellophane Moving Up

Cellophane producers—fighting for new markets as well as to keep old customers—are off on new selling tacks. Two major producers, Olin Mathieson and Du Pont, are now revamping and expanding marketing efforts. But their approaches are vastly different.

Olin is launching a large-scale advertising program, designed to strengthen cellophane's position as a packaging material. Du Pont, on the other hand, is revising its distributor setup for supermarket users.

The Campaigns: Du Pont's first step: concentrating supplies of cellophane sheets for supermarkets. The company now will sell the sheets through only a few large distributors, probably one in each state. Aim: to make large stocks available to buyers at centralized sources, rather than providing small supplies at numerous jobbers.

In addition, Du Pont is sending out a special sales force to work with the distributors' salesmen. One Du Pont man will be assigned to each of six geographical districts.

Each special staffer will serve as instructor, technical serviceman and sales promoter. Rather than to sell cellophane to the distributors, his job will be to help the distributors' salesmen expand their own markets for the Du Pont products.

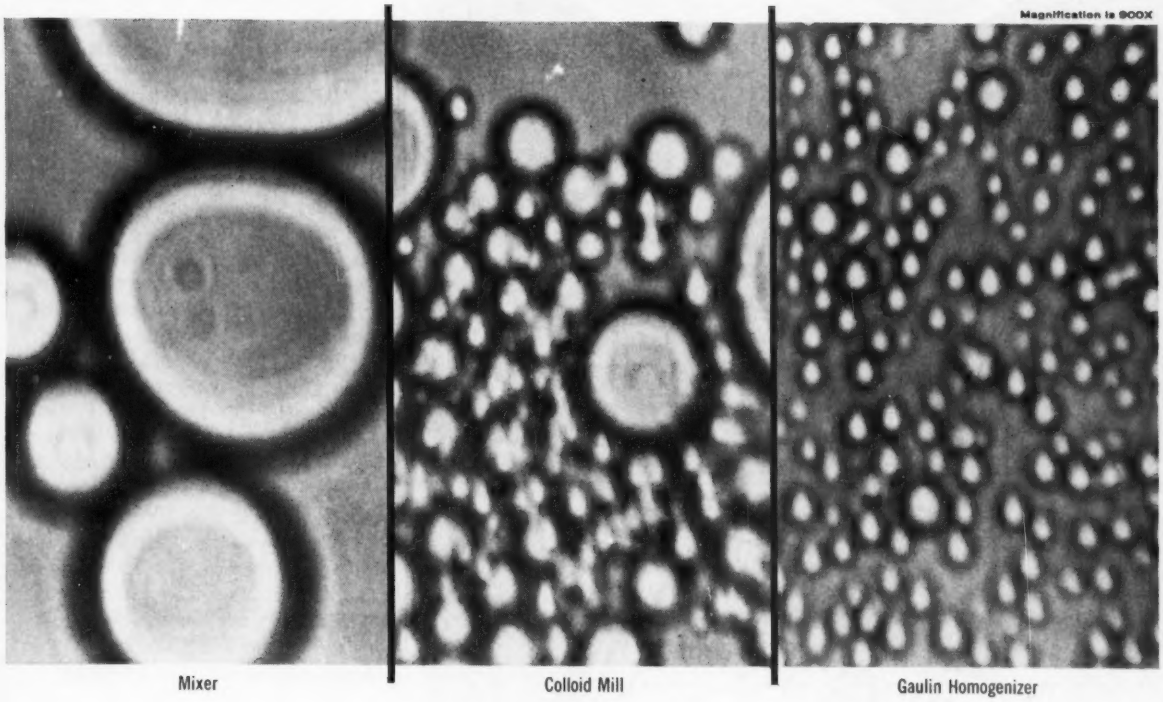
Du Pont's cellophane sales got another boost earlier this year when it introduced higher-yield films — more square inches per pound (*CW, April 22, p. 27*).

Four-Way Campaign: Olin's ad program for its packaging division is divided into several specific campaigns: (1) general packaging markets, (2) specific product promotion, (3) specific industry users, (4) consumer interest and support.

Although cellophane has a big chunk of the film market—some 439 million lbs. last year—its growth rate is said to be unsatisfactory to most producers.

In '60 output rose only 3 million lbs., less than 1%. More than three times this rate is needed to reach the 600-million-lbs. output by '70, predicted last year by a Du Pont official. Whether these new campaigns will give the necessary boost to growth should soon become clear.

What's the Best Particle Size for Your Product?



Mixer | Colloid Mill | Gaulin Homogenizer

Gaulin Technical Assistance will give you the answers

You can make important changes in the chemical and physical properties of your product simply by controlling its particle size.

A slight size reduction in dispersing, emulsifying or blending will change everything from its color to its taste, the speed with which it chemically reacts, and almost every other property it has.

Gaulin Technical Assistance gives you a chance to fully explore the advantages of various particle sizes—to find the best energy level (type of equipment) for your product.

And since we manufacture a complete line of homogenizers, colloid mills and submicron dispersers, we can provide you with the best means for achieving the particle size you desire.

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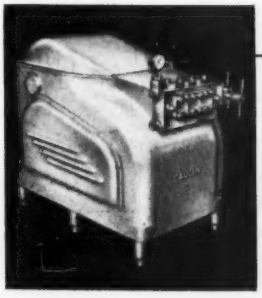
See Chemical Engineering Catalog for address of your nearby Manton-Gaulin Representative.



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72 Garden St., Everett 49, Mass.

World's largest manufacturer of stainless steel reciprocating pumps, pressure exchange pumps, dispersers, homogenizers and colloid mills.

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CS CHEMICAL SOLVENTS, INC.
60 PARK PLACE, NEWARK 2, N. J.
WOrth 2-7763 (N.Y.) MArket 2-3650 (N.J.)

New Midwest Terminal

Initial dredging is getting under way this week for a big new storage terminal for bulk liquids (and some granular material) at Chicago's Lake Calumet Harbor. When completed—in about two years—it will provide up to 200 million gal. of bulk liquid storage, plus handling and packaging facilities.

The $17-million terminal is being built for Bulk Terminals Co., a new subsidiary of Union Tank Car Co. It resembles a project planned for the same general location by General American Transportation Co. but abandoned in '57.

The new project is part of the private development phase of the Port of Chicago. It had been held up pending approval of plans to deepen the Calumet River Channel from its present 21-ft. depth to 27 ft. (depth of the St. Lawrence Seaway).

E. A. Locke, Jr., president of Union Tank Car, says that the terminal will provide storage for granular commodities, in addition to petroleum, petrochemicals, industrial chemicals, vegetable oils, molasses and animal fats.

Bulk cargoes now move into the Lake Calumet area 12 months a year. The new terminal will permit storage of this cargo, pending movement during the seasons when lake and Seaway shipping is not stalled by freeze-ups.

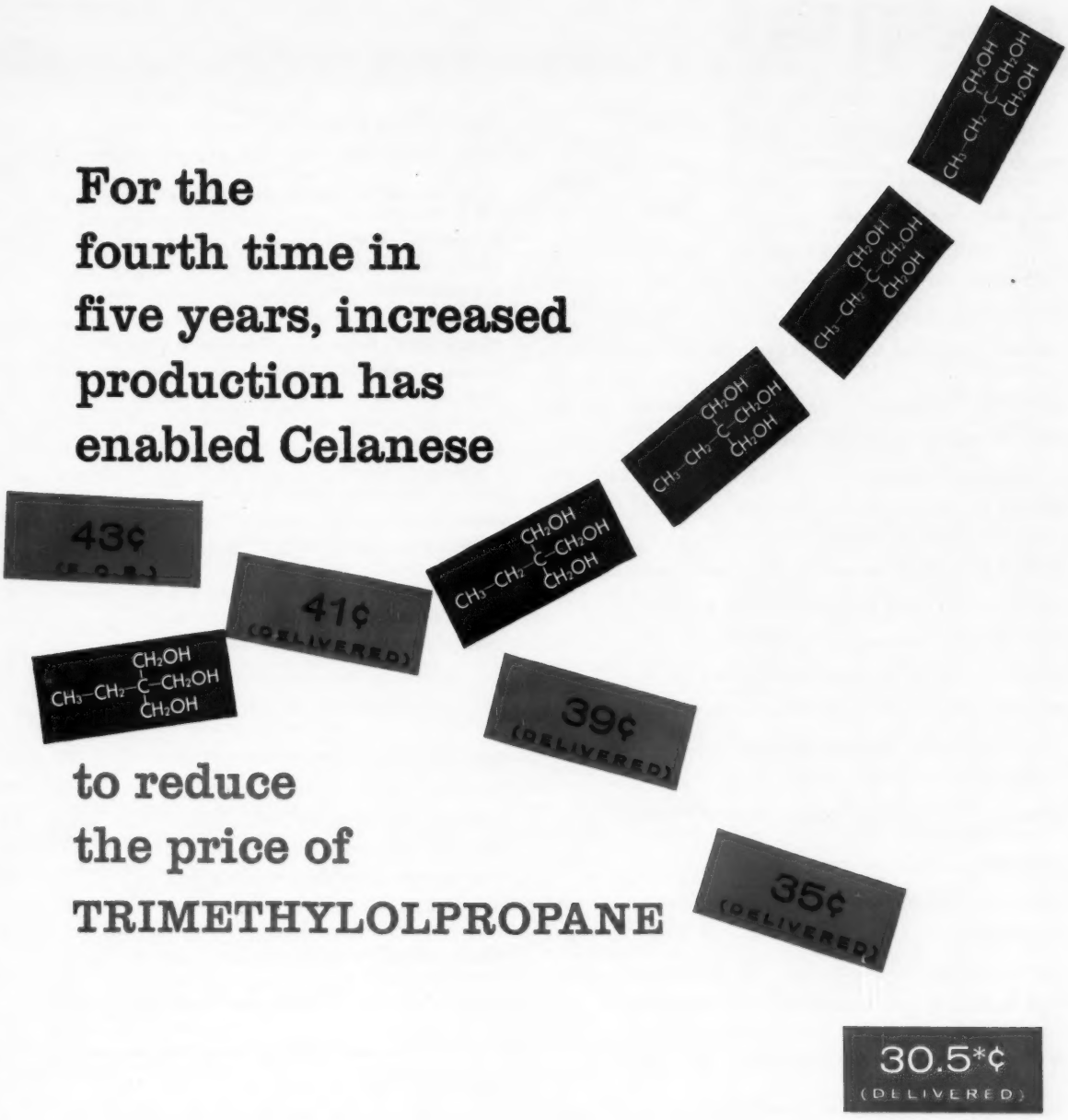
European CPI Guide

The first European CPI directory —covering both the Common Market and the Free Trade Assn.—will be published late this month by Foster D. Snell, Inc., New York marketing and research firm.

The book, titled "The Common Chemical Market," lists more than 6,000 chemical manufacturers and dealers and includes a brief statistical review of the chemical process industries in each of the 13 European nations in the two trade blocs.

The 200-page directory lists companies alphabetically by nation, and by Standard Industrial Classification (SIC) number in each city. The first printing, about 1,000 copies, will be available in early June. It will be distributed free only to new and renewal subscribers to Snell's *Chemical Market Abstracts*.

For the fourth time in five years, increased production has enabled Celanese



to reduce the price of TRIMETHYLOLPROPANE

Celanese trimethylolpropane—the ideal intermediate for producing urethane foams and coatings, and alkyd resins—is now available at the lowest price in its history: *30.5¢ per pound.* That means you can get all the many advantages of trimethylolpropane—and save money at the same time.

In urethane foams, trimethylolpropane offers three *primary* hydroxyls as the base for polyethers. This results in uniform products and assures reproducibility. It also means improved dimensional stability and heat distortion points in the finished foams. Used in urethane coatings, this intermediate improves heat, chemical and corrosion resistance.

Alkyd resins made with trimethylolpropane are characterized by impact resistance, hardness, flexibility, adhesion, and resistance to yellowing, heat and chemical attack.

At the new low price, you simply can't afford *not* to investigate the advantages of trimethylolpropane in your application. For information, please write, briefly outlining the use you have in mind. Celanese Chemical Company, Dept.652-E, 180 Madison Ave., N.Y. 16.

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SALES

DATA DIGEST

• **Plastic Starches:** Brochure (T-8) describes two types of plastic starches —one for use in conventional packages, the other for aerosol packaging. Polyvinyl Chemicals, Inc. (26 Howley St., Peabody, Mass.).

• **Chemical Glossary:** New, 11-page booklet lists 483 organic chemicals by company code number, company name, *Chemical Abstracts* name and generic or tradename. Products are listed for the chemical and pharmaceutical industries, including dyes, pigments, certified food colors, biological stains and indicators. Dept. NA 60, National Aniline Division, Allied Chemical Corp. (40 Rector St., New York 6).

• **Plastic Coating:** Bulletin (No. 1007) describes medium-priced, corrosion-resistant plastic coating for metal. Suggested uses: exterior coating for protection against acid spillage or corrosive atmosphere; and interior coating resistant to attack by most acids, alkalis, salts and many solvents to 210 F. Pfaudler Co. (1128 West Ave., Rochester, N.Y.).

• **Sodium Aluminate:** Process bulletin (P-3) outlines preparation and application methods of sodium aluminate solution as an aid to sizing and as a flocculation agent. Nalco Chemical Co. (6216 West 66th Pl., Chicago).

• **Formulary:** Laboratory bulletin suggests starting formulations for compounds used in sanitary chemical, soap, cosmetic, metal treating, oil drilling, dyestuff, textile processing and maintenance chemical industries. Continental Chemical Co. (195 21st Ave., Paterson, N.J.).

• **Plastics Properties:** Brochure cites characteristics, physical and chemical properties of thermoplastics, thermosets and high-pressure laminates. Data charts also include applications, mechanical, electrical and thermal properties of phenolics, silicones, melamines and epoxies. Commercial Plastics & Supply Corp. (630 Broadway, New York 12).

• **Ethanolamines:** Technical bulletin outlines latest physical and chemical data on mono-, di- and triethanolamines. Major applications: detergents, textiles, gas treating, toilet goods, waxes, lubricants, pharmaceuticals and cement additives. Jefferson Chemical Co., Inc. (1121 Walker Ave., Houston 2, Tex.).

FYI: Chemical Week Reprints

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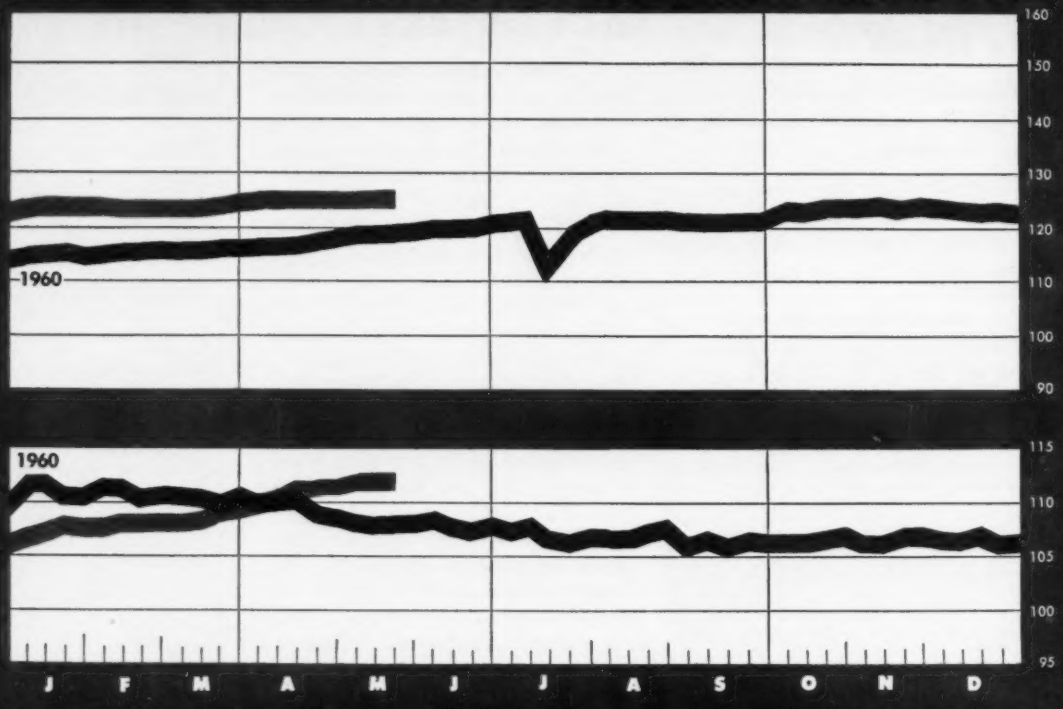
BUSINESS BENCHMARKS

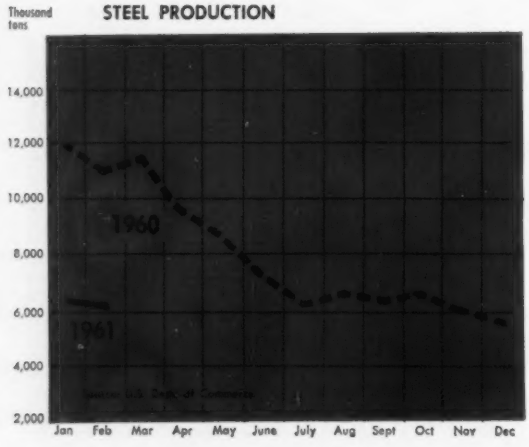


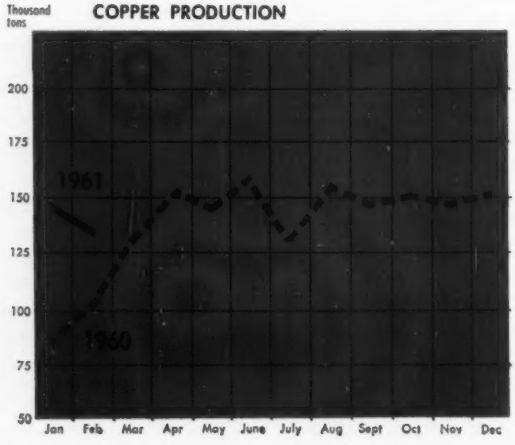
MAY 20, 1961

WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
Chemical Week output index (1957=100)	126.4	126.5	121.0
Chemical Week wholesale price index (1947=100)	113.3	113.2	108.8
Stock price index (12 firms, Standard & Poor's)	51.53	51.17	59.29
Steel ingot output (thousand tons)	1,943	1,858	2,137
Electric power (million kilowatt-hours)	14,206	14,254	13,495
Crude oil and condensate (daily av., thousand bbls.)	7,138	7,249	6,771

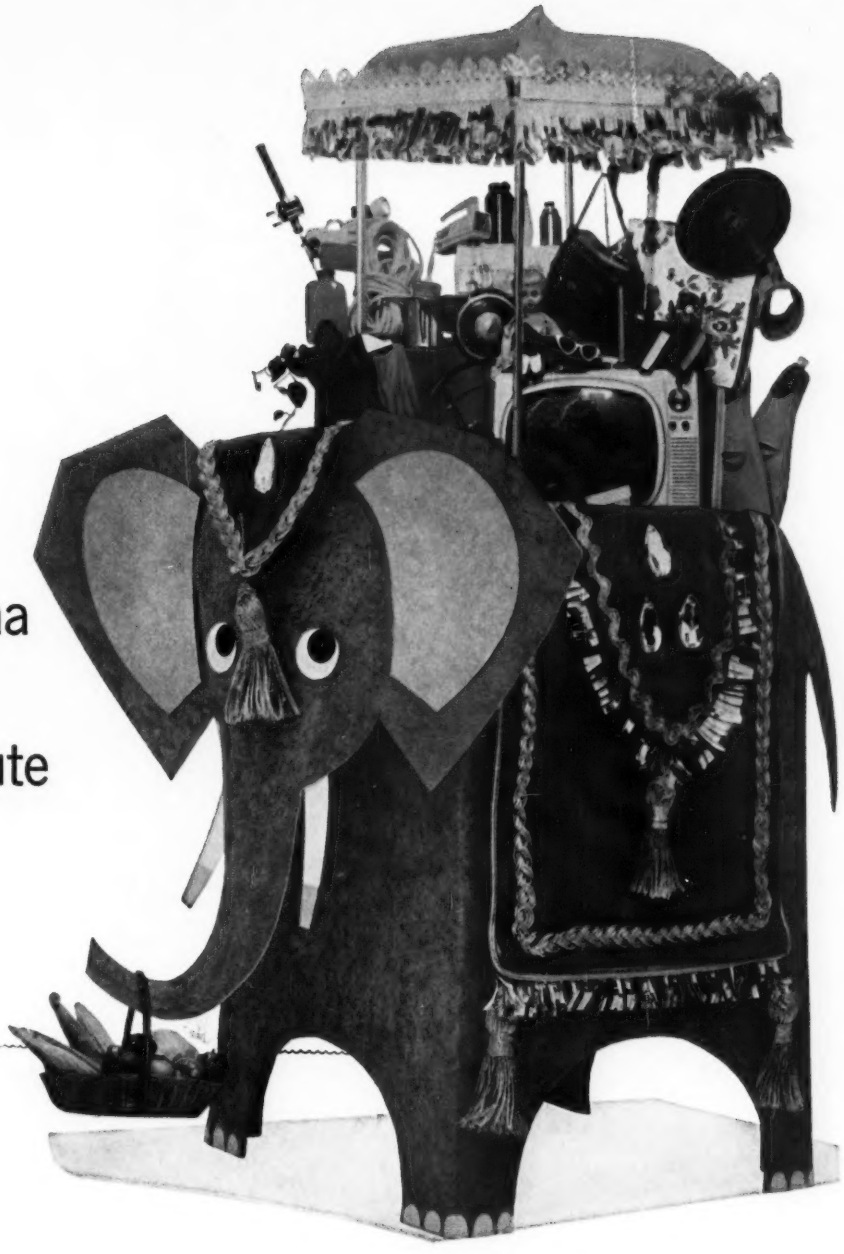
TRADE INDICATORS (Billion dollars)	MANUFACTURERS' SALES			MANUFACTURERS' INVENTORIES		
	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
All manufacturing	28.98	28.67	31.58	53.61	53.67	53.90
Chemicals and allied products	2.30	2.26	2.38	4.21	4.17	4.05
Petroleum and coal products	3.24	3.23	3.13	3.31	3.29	3.40
Paper and allied products	1.08	1.06	1.07	1.63	1.62	1.54
Textile products	1.09	1.08	1.26	2.73	2.70	2.65

CHEMICAL CUSTOMERS CLOSE-UP





Vasco da Gama sailed an uncharted route



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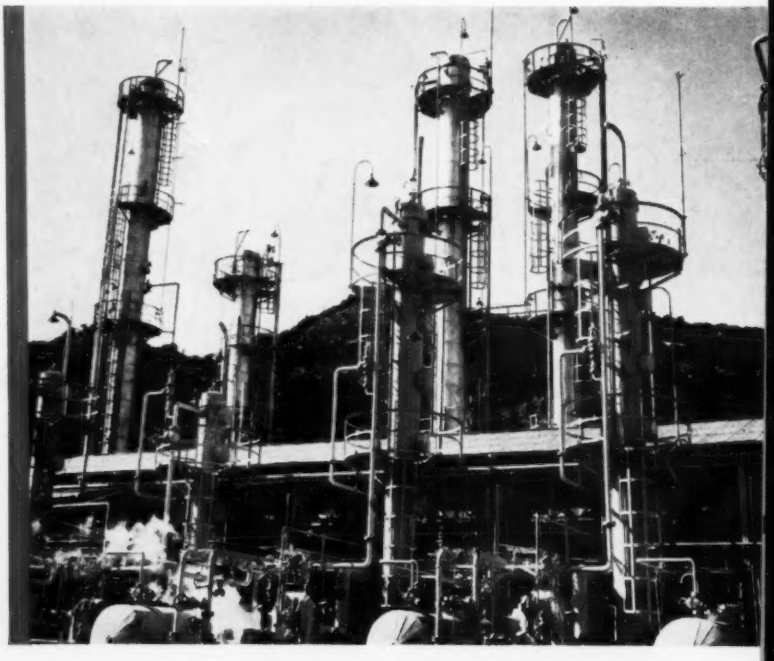

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